Carroll & Browne Consultants

Design and Management

SOUTH DUBLIN COUNTY COUNCIL

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South Dublin County Council

ADAMSTOWN ROAD (R120) IMPROVEMENT SCHEME

ENVIRONMENTAL REPORT

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ADAMSTOWN ROAD (R120) IMPROVEMENT SCHEME

ENVIRONMENTAL REPORT

Project No. 12027

Report No.R01 Rev. D4

August 2012

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1 Introduction

1.1 Project Description

Carroll & Browne Consultants have been appointed by South Dublin County Council as Consulting Engineers for the preparation of documentation for public display for the Adamstown Road (R120) Improvement Scheme in accordance with the Planning and Development Act 2000 and Part 8 of the Planning and Development Regulations 2001.

A preliminary design has been prepared for the Scheme incorporating the improvement works to the Adamstown Road, (along with associated junctions and accesses), and the widening of the existing 12th Lock Bridge over the Grand Canal. The scheme is located within the townlands of Adamstown, Grange and Ballymakaily

The proposed improvements to the Adamstown Road will extend for a distance of approximately 1.2 km from a point 0.5km north of the existing R120/Nangor Road Junction, to a point 0.3km north of the Grand Canal, where the Road was previously upgraded as part of the Adamstown SDZ project. In order to increase safety for pedestrians and vulnerable road users, footpaths, cycletracks, pedestrian crossings and public lighting will be provided along the full extent of the improvement works.

A Scheme location plan is presented in Figure 1.1.

The Existing and Proposed Road Layout is shown in Figures 1.2 and 1.3.

1.2 Need for Scheme

The proposed works will improve the horizontal and vertical characteristics that limit forward visibility on the existing road. As there are currently no footpaths or cycletracks, and limited public lighting on the existing road, the proposed works will substantially improve safety for pedestrians and cyclists, and will provide proper public lighting along the entire route.

A set of traffic lights is currently in operation at the 12th Lock Bridge (Leck Bridge). Traffic is filtered in a “stop/go system” as the bridge has insufficient width to safely accommodate two-way traffic. The existing configuration at the bridge does not allow adequate visibility for vehicles emerging from the adjoining tow-paths.

The improvement to this section of the Adamstown Road is identified in the South Dublin County Development Plan (2010 – 2016) where it is included as a long-term roads objective, Section 2.2.38.i, Policy T 39, and Table 2.2.6 refer.

The proposed Improvement Scheme is included as an objective in the Lucan / Clondalkin Integrated Framework Plan for Land Use and Transportation (IFPLUT), 2003.

The proposed road improvement scheme forms a key element of the 12th Lock Masterplan, which is a Specific Local Objective (No. 37) of the South Dublin County Council Development Plan (2010 – 2016).

The proposed Scheme will support the objectives embodied in the National Transport Authority's Greater Dublin Area Transport Strategy in respect of improving safety for all road users, and facilitating increased cycle usage and walking.

1.3 Purpose of this Report

The Environmental Report has been prepared to support of the Part 8 Planning Procedure, to provide details of the proposed Road Improvement works which cross the Grand Canal, (a proposed Natural Heritage Area), and include the widening of the 12th Lock Bridge in close proximity to the 12th Lock, (both Protected Structures, ref. nos.127 and 125 respectively in County Development Plan).

The Environmental Report describes the Scheme, and its interaction with its surrounding environment. Predicted environmental aspects, associated impacts, together with proposed mitigation measures are given.

Specialist reports have been commissioned including an Ecology Report, a Cultural Heritage Report and a Bridge Inspection Report to ensure that all environmental aspects of the Scheme are fully assessed and appropriate mitigation measures identified. The proposed Scheme has undergone Appropriate Assessment Screening under the Habitats Directive (92/43/EEC). All relevant objectives contained in the County Development Plan in so far as they apply to the proposed scheme will be complied with, including those relating to:

(i) Landscape, Natural Heritage and Amenities;

- 4.3.7.vi Policy LHA8 – Special Areas of Conservation and proposed Natural Heritage Areas
- 4.3.7.vii Policy LHA9 – Impacts on Natura 2000 Sites

- 4.3.7.xvii LHA19 – Flora and Fauna
- 4.3.7.xxi Policy LHA 23 – Protection of the Grand Canal

(ii) Specific Local Objectives;

- SLO 36; 12th Lock Canal Bridge
- SLO 37 – 12th Lock Masterplan

1.4 Planning Context

The proposed Road Improvement Scheme is a Prescribed Development as set out in Part 8 of the Planning and Development Regulations 2001 to 2012. Article 80 (1) (b) and (c) defines Prescribed Development as follows:

Article 80 (1) (b); The construction of a new road or the widening or realignment of an existing road, where the length of the new road or of the widened or realigned portion of the existing road, as the case may be, would be –

(i) in the case of a road in an urban area, 100 metres or more, or

(ii) in the case of a road in any other area, 1 kilometre or more,

Article 80 (1) (c); the construction of a bridge or tunnel.

As the proposed road improvement scheme consists of approximately 1.2km of existing road, together with the widening of the 12th Lock Bridge, it constitutes a Prescribed Development in accordance with Articles 80 (1) (b) (ii), and 80 (1) (c).

As it is considered that the proposed improvement works are not likely to have significant effects on the environment, and as the proposed road improvement works are below the prescribed thresholds as described in the Roads Regulations, a full Environmental Impact Statement (EIS) is not required. (Section 50(1), Roads Act 1993 and Article 8(a) and (b), Roads Regulations 1994 refer).

1.5 Scope

The Environmental Report identifies the likely effects of the proposed road improvement scheme on the environment particularly in the vicinity of the Grand Canal, the 12th Lock and the 12th Lock Bridge, and identifies appropriate mitigation measures.

Figure 1.1 - Location of Proposed Road Improvement Scheme

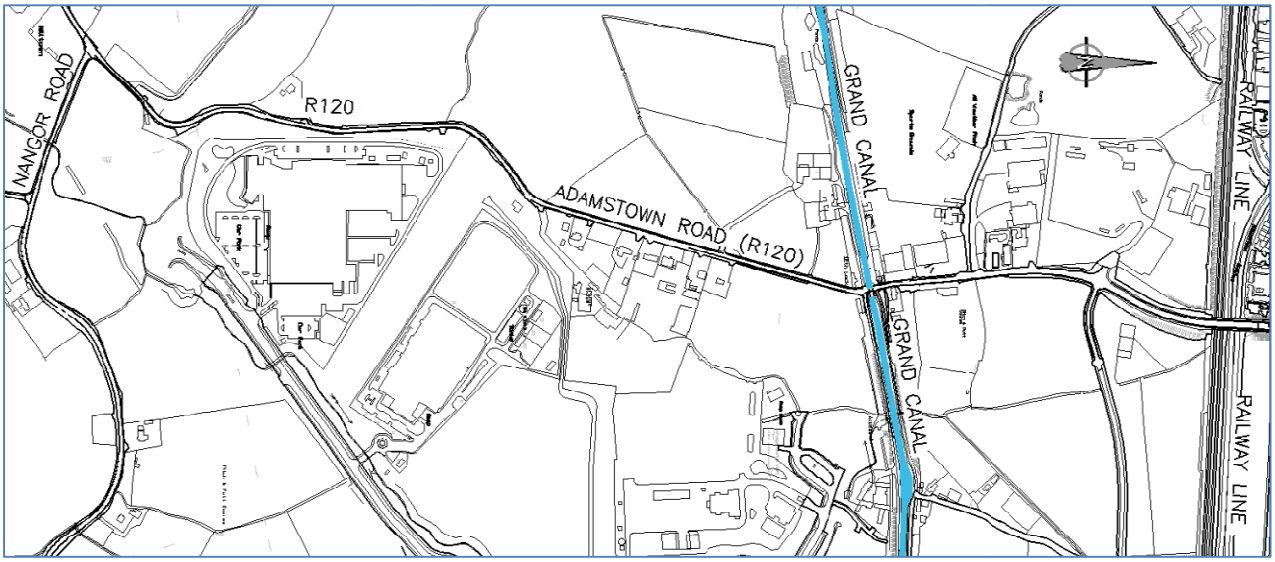


Figure 1.2 - Existing Road Layout

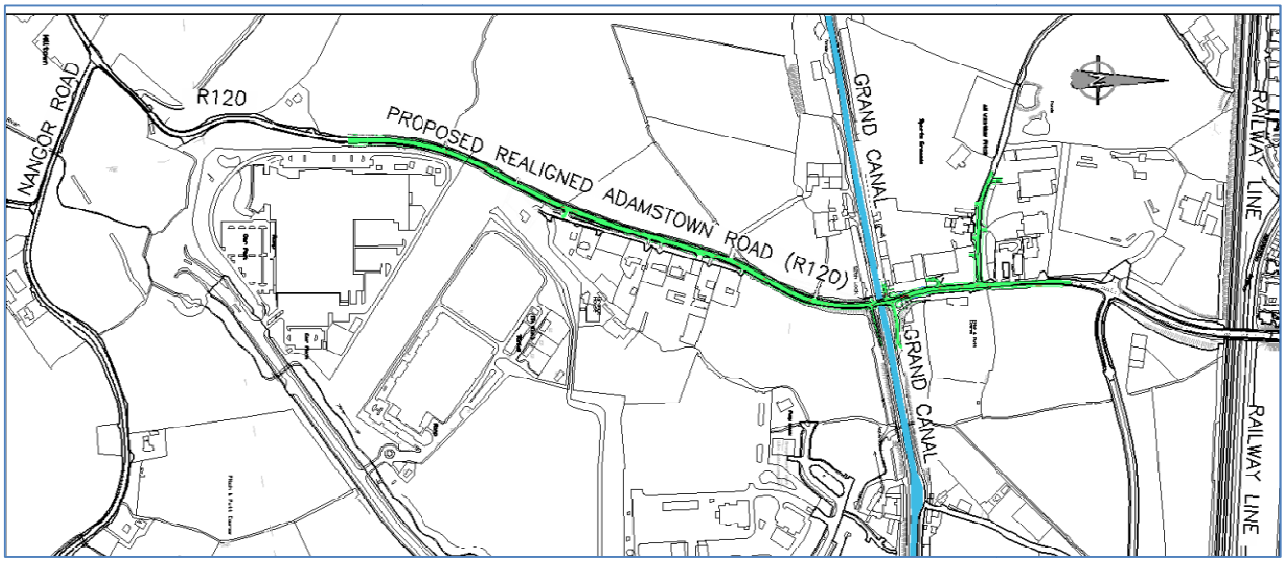


Figure 1.3 - Proposed Road Layout

2 Regional Setting of the Proposed Development

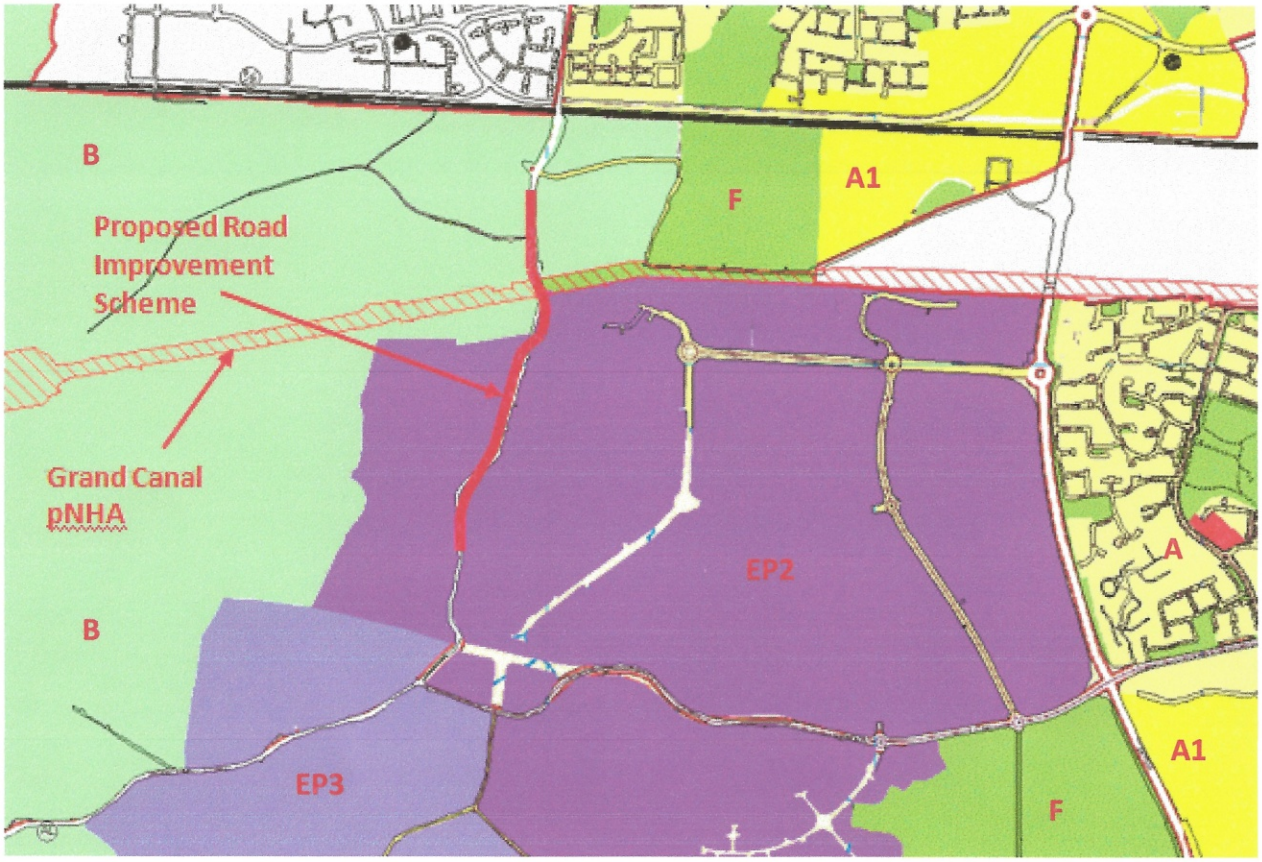
2.1 Responsible Authority

The Scheme is located approximately 4km south of Lucan Village, approximately 13km west of Dublin City centre, and approximately 7.5km northwest of Tallaght Town Centre. The Local Authority responsible for this area is South Dublin County Council.

2.2 Land Zoning

The lands in the vicinity of the proposed scheme are zoned as follows and as shown in Figure 2.1:

Objective B	To protect and improve Rural Amenity and to provide for the development of Agriculture
Objective EP2	To facilitate opportunities for manufacturing, Research and Development facilities, light industry, and employment and enterprise related uses in industrial areas and business parks
Objective F	To preserve and provide for Open Space and Recreational Amenities.



Development Plan Zoning Objectives

A	To protect and/or improve Residential Amenity
A1	To provide for new Residential Communities in accordance with approved Area Plans
B	To protect and improve Rural Amenity and to provide for the development of Agriculture
CT	To protect, improve and provide for the future development of the County Town of Tallaght
DC	To protect, provide for and/or improve District Centre facilities
EP1	To facilitate opportunities for intensive employment uses complemented by mixed-use development based on a principle of street networks and in accordance with approved plans
EP2	To facilitate opportunities for manufacturing, Research and Development facilities, light industry, and employment and enterprise related uses in industrial areas and business parks
EP3	To provide for distribution, warehouse, and logistics and related industry facilities which require good access to the major road network within a good quality environment
F	To preserve and provide for Open Space and Recreational Amenities
G	To protect and improve High Amenity Areas
GB	To preserve a Green Belt between Development Areas
H	To protect and enhance the outstanding natural character of the Dublin Mountains Area
I	To protect and enhance the outstanding character and amenity of the Liffey Valley and to preserve its strategic importance as a green break between urban settlement areas
LC	To protect, provide for and/or improve Local Centre facilities
TC	To protect, provide for and/or improve Town Centre facilities

Figure 2.1 – Zoning in vicinity of proposed Scheme

3 Description of the Receiving Environment

3.1 Land Use

Figure 3.1 shows land use surrounding the Scheme.

Current land use in the surrounding area is primarily agricultural, industrial / commercial or recreational. A small number of residential dwellings are located along the Adamstown Road within the extents of the Scheme.

South of the canal, the land-use adjacent to the existing road is primarily agricultural on the western side, whilst Grange Castle Business Park and a small number of households and businesses are located to the eastern side of the road. The households and small businesses, (but not Grange Castle Business Park), have direct access onto the existing carriageway.

In the vicinity of the canal at the 12th Lock Bridge, residential and commercial properties are located immediately adjacent to the tow-paths.

North of the canal there is more intensive land-use, including industrial premises, Lucan Pitch and Putt Club, Lucan Sarsfields GAA Club, a builders providers and a service station.

3.2 Traffic

A count of traffic on the existing R120 at the 12th Lock Bridge was undertaken on Thursday 28th June 2012 from 07:00 to 10:00 and from 15:00 to 18:00, which covered both the AM and PM peaks. The numbers of pedestrians and cyclists were also recorded along Adamstown Road during the count periods.

It was found that the AM peak hour was from 08.00 to 09.00 and the PM peak hour was from 16.45 to 17.45. The traffic count data was expanded to obtain an estimate of the Annual Average Daily Traffic (AADT), which gives an AADT of 7,440 for the R120 at this location.

3.3 Existing Watercourses

The River Griffeen is located within 200m of the existing R120 at its nearest point, where it flows through a culvert under the Grand Canal.

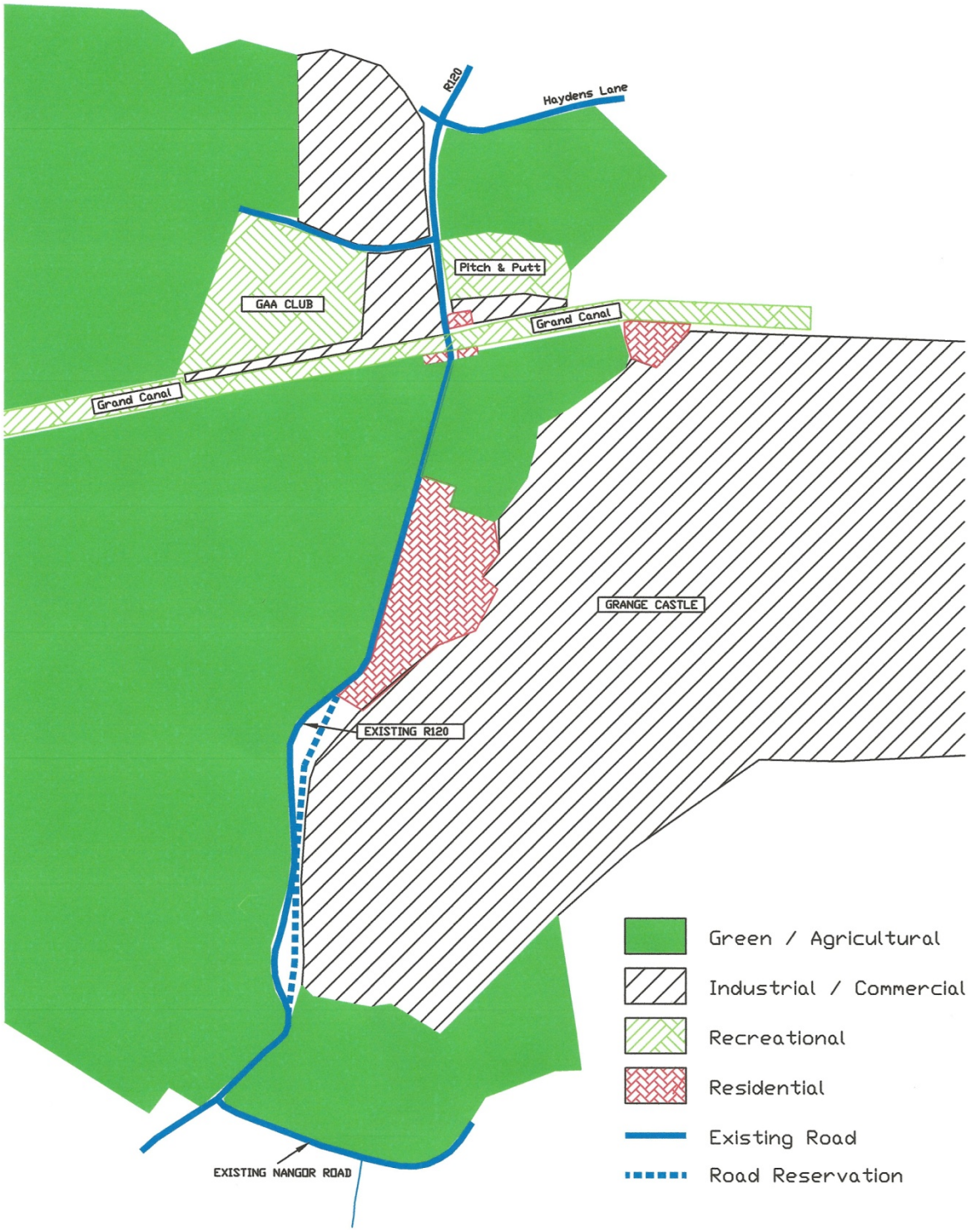


Figure 3.1 – Existing Land Use in vicinity of proposed Scheme

The Adamstown Road crosses the Grand Canal at the 12th Lock Bridge, immediately east of the 12th Lock.

Surface water from the Adamstown Road currently discharges to the River Griffeen and indirectly via the millrace into the Grand Canal. Whilst silt traps are provided on all road gullies, there is no current provision for surface water attenuation or oil / petrol interceptors.

3.4 Material Assets

1. South of the canal, the land is predominantly agricultural to the west of the Adamstown Road. On the east of the Adamstown Road there is a stretch of linear residential development.

2. Towpaths are present along the north and south banks of the canal, and residential and commercial properties are located immediately adjacent to these paths at the 12th Lock Bridge. The canal presents unique recreational opportunities, including fishing and boating, and a new pedestrian and cycle way on its southeast tow-path (which extends to Inchicore).

3. North of the canal is dominated by commercial properties on the west side of Adamstown Road including a filling station, Adamstown Industrial Estate and the former Univar site (now in the ownership of South Dublin County Council). There are also a number of recreational facilities including Lucan Pitch and Putt Club and Lucan Sarsfields GAA Club north of the canal.

3.5 12th Lock Bridge

The 12th Lock Bridge, also known as Leck Bridge, is a protected structure (Ref. No. 127). The bridge comprises a 6.07m single span masonry arch structure (C.1770) widened to the east in 1932 with a reinforced concrete slab, giving an out-to-out width of approximately 7.9m. The bridge carries a 5.73m carriageway with a 0.9m footway along the east side.

Both bridge parapets are roughcast rendered and have semi circular granite copings. Parapets are 340mm wide and approximately 1.0 and 0.8m high above the adjacent footway / carriageway level at the east and west respectively. The dressed granite coping blocks are missing from both ends of the east parapet and the unit at the north end of the west parapet is displaced. The missing copings can be seen in the canal waters and it is considered that they can be recovered in due course.

The canal training walls are of square cut limestone masonry construction and are in good condition with only occasional open joints requiring re-pointing. The spandrel wall on the west elevation of the structure is covered in a concrete render.

The 12th Lock is of c.1770 origin. It is a single-stage canal lock and is listed as a protected structure in the South County Dublin Development Plan (Ref. No. 125).

A Structural Inspection of the bridge was undertaken by Roughan & O'Donovan Consulting Engineers and is included as Appendix 1.

Photos of the 12th Lock Bridge are shown on Figures 3.2, 3.3, 3.4 & 3.5.

Figure 3.2 – West Elevation

Figure 3.3 – East Elevation

Figure 3.4 – Underside of 1932 bridge extension

Figure 3.5 -Underside of 1770's Arch Structure

4 Description of the Proposed Development

4.1 Proposed Road Improvements

The main elements of the Scheme are described below:

- On-line road improvements consisting of approximately 860m of 7.0m carriageway to the south of the Canal, and approximately 340m of 6.5m carriageway north of the Canal. The proposed cross section, south of the canal, consists of two 3.5m lanes, two 1.5m cycle tracks and two 1.8m footpaths. North of the canal, the road will consist of two 3.25m lanes and two 2.5m combined footway/cycletracks.

- Two pedestrian crossings, one of which is located at the 12th Lock Bridge to cater for pedestrians/cyclists using the new pedestrian and cycling route on the canal.

- Provision of public lighting, road markings and signage.

- Removal of structures, construction of embankments.

- Widening of the 12th Lock Bridge to the east, including the preservation of the 1770's stone arch.

- Improved combined accesses/junctions providing safer access conforming to current standards.

- Rationalisation and realignment of property accesses (road, towpaths and private entrances) as necessary to tie in with the improved Adamstown Road.

- Construction of accesses, realigned canal towpaths, boundary treatments and appropriate landscaping works.

- Provision of road drainage, including silt traps, surface water attenuation, oil interceptors and other utility features.

Typical cross-sections of the proposed improved road are shown on Figure 4.1.

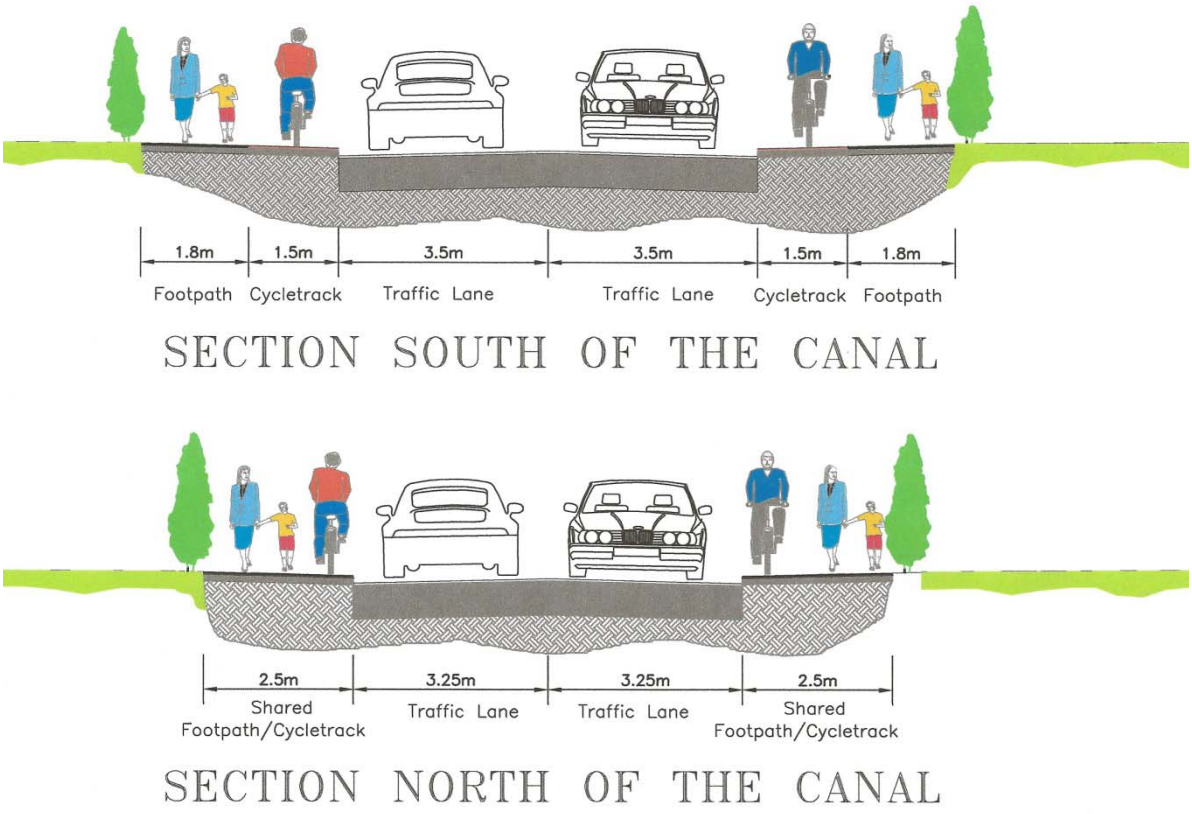


Figure 4.1 - Typical cross-section of the proposed improved road

The current road drainage arrangements involve discharge to roadside ditches or road drainage pipework, which in turn discharge into either the River Griffeen or Grand Canal via the millrace immediately north of the 12th Lock Bridge. It is proposed to amend this arrangement whereby no road drainage will discharge to the Grand Canal. The proposed surface water system will consist of two separate outfalls, one north of the canal and one south of the canal. Both systems will include silt traps, surface water attenuation measures and oil interceptors and will discharge to the River Griffeen. Existing roadside ditches and some culverts will require local realignment or extension where the road improvement impacts on them.

A limited number of properties will be affected by the proposed road improvement. As part of the Works a number of field entrances and entrances into residential and business properties will be relocated or re-graded.

It is not possible to maintain the existing access arrangements for a number of the properties, including the pitch and putt club to the north of the canal. Alternative access arrangements are proposed, and are shown on Figure 4.2. These proposed arrangements provide a similar 1-way traffic system for traffic exiting the pitch and putt course. The proposed arrangement combines four accesses into one access, thereby providing a safe layout for Lucan Pitch and Putt Club and adjoining properties.

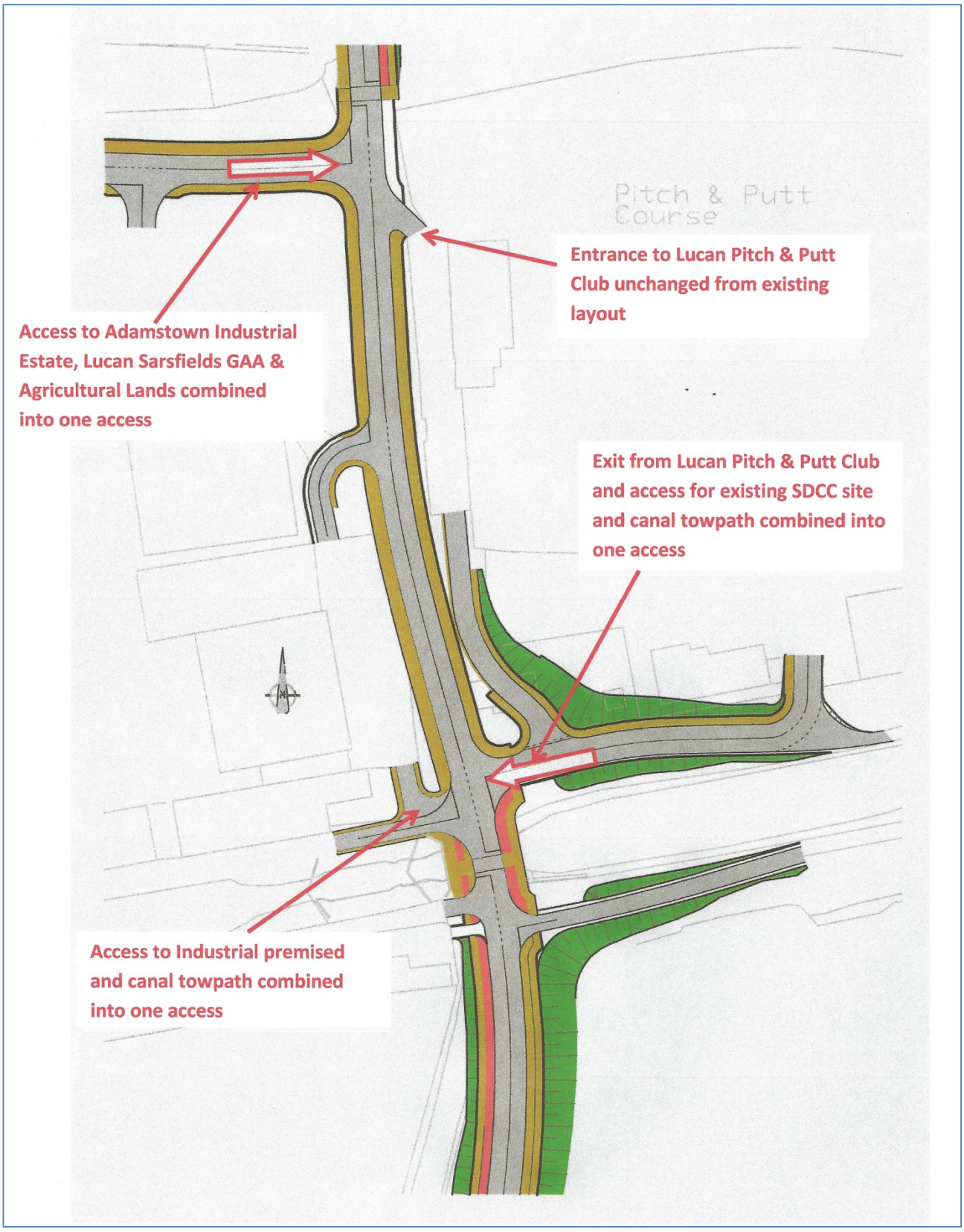


Figure 4.2 – Access arrangements in the vicinity of the 12th Lock

4.2 12th Lock Bridge

The existing 12th Lock Bridge, which is a protected structure, will be widened to the east to accommodate the proposed road improvement. The current width of the bridge is 8.13m and this will be extended to approximately 16.3m. The original stone arch (3.5m wide) on the western elevation will remain unaffected by the proposed improvement works.

A Structural Assessment of the 1932 reinforced concrete bridge extension will be undertaken to determine if it has the structural capacity to accommodate current bridge loading requirements. If the Structural Assessment shows that the structure has adequate structural capacity then it will be retained and a new extension will be built to the east providing the necessary width for the widened road. If however the Structural Assessment shows that the structure has inadequate structural capacity then it will be removed and a wider replacement extension will be built to the east providing the necessary width for the widened road.

The existing western elevation incorporates a single span masonry arch. The existing eastern elevation incorporates a flat reinforced concrete slab. It is proposed to reproduce an arch on the new eastern elevation, matching and reflecting the original western elevation. An elevation of the proposed eastern side of the bridge is shown as Figure 4.3.

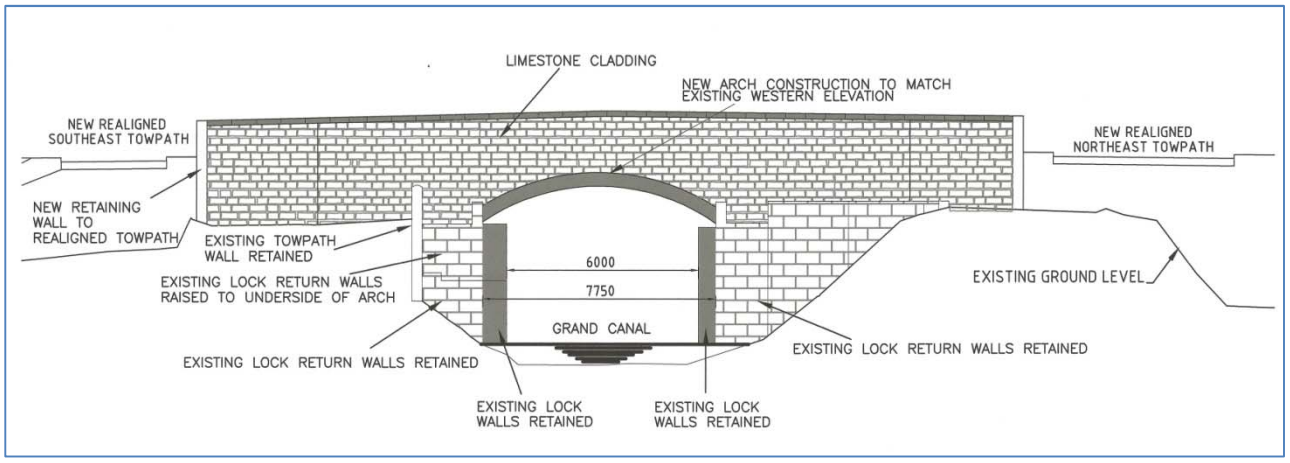


Figure 4.3 – Proposed Eastern Elevation of 12th Lock Bridge Extension

5 Description of Activities Associated with the Proposed Development

The main elements of the Scheme are described in the Chapter 4. This Chapter briefly describes the main activities, equipment, and materials typical of road construction.

5.1 Online Sections of Road Improvement

Where it is proposed to improve the existing road on its current alignment, the pavement will be removed and re-constructed in accordance with the proposals for "Off-Line Sections of Road Improvement" below.

5.2 Offline Sections of Road Improvement

Where the proposed improvement works require sections of roads to be constructed outside of the existing road footprint, topsoil and subsoil will be stripped by excavator to a depth of approximately 600mm below the proposed road surface level depending on the nature of ground conditions. The topsoil will be stored for reuse for landscaping purposes.

The exposed road formation will be compacted with rollers before being covered with crushed stone material. It is not envisaged that rock will be encountered on this Scheme.

5.3 Contractors Site Facilities

Contractors site facilities will be located as close to the works as possible and include toilets, office(s), materials store(s) and a basic workshop to carry out minor maintenance of construction equipment. For security purposes the site facilities will be fenced and illumination will be provided.

5.4 Salient Equipment and Materials Used During Construction

A list of salient equipment and material used during the construction and upgrading of roads and junctions is given in Table 5.1.

Table 5.1. Equipment and materials used during roadwork construction activities

Equipment	Materials
Road construction and Upgrading	
Pneumatic tools (e.g. hammers, compactors)	Wood
Generators	Signs
Compressors	Stone, Gravel, Bitumen
Trucks	Concrete, precast concrete elements
Earth moving equipment (e.g. graders, front loaders)	Stone, Gravel, chippings, ducting, drainage pipes
	Stocks of ducting, drainage pipes, precast manhole rings etc.
Contractors Site Facilities	
Fencing	Oil, grease, diesel drums
Portable toilets	Spare parts
Pre-fabricated office(s)	Traffic management material (cones, signs etc)
Diesel, oil and grease store(s)	

5.5 Working Times during Construction

Generally construction activities will be confined to 8.00am to 7.00pm Monday to Friday and 8.00am to 4.30pm on Saturdays.

6 The Proposed Development's Environmental Aspects, Impacts and Mitigation Measures

6.1 Methodology

This Chapter describes how activities may interact with the environment during the construction and operation phases. This interaction is termed "environmental aspect".

Each aspect directly or indirectly causes one or more environmental impacts under planned or unforeseen conditions. An unforeseen condition occurs as a result of an accidental event outside the scope of normal operation, which results in damage to material assets and direct or indirect impacts on human and physical environments (e.g. motor vehicle collisions). For the purposes of this assessment short term impacts are three years or less.

Environmental impacts have been predicted using a desktop study and a site scan. Criteria used for the rating of impacts are described in Appendix 2. Impacts are rated under unmitigated circumstances, however numerous mitigation measures proposed in this Chapter will avoid, reduce or remedy most impacts.

6.2 Construction Phase

Predicted environmental aspects, impacts and mitigation measures associated with constructing the Scheme's main elements are given in this section.

6.2.1 Human Beings

Predicted impacts on human beings include travel/access, employment, vehicular and pedestrian traffic and community severance.

a) Employment

Aspect:

People will be employed to build the Scheme.

Impact:

Income will be generated for local businesses causing multiplier effects on the local economy. This will be a slight positive impact of short-term duration.

Proposed Mitigation Measure(s):

No mitigation measures required.

b) Community Severance

Aspect:

The construction activities, and in particular those activities relating to the widening of the 12th Lock Bridge and on the sections of road adjacent to dwellings, businesses & leisure facilities, may result in occasional short term community severance.

Impact:

Increased difficulty for local residents/businesses to travel between each other's homes/premises.

Proposed Mitigation Measure(s):

- Where necessary temporary pedestrian measures will be included into the traffic management arrangements
- Temporary pedestrian crossings will be provided, if necessary, at locations agreed with local representatives following consultation;
- Road users and local residents will be forewarned of possible road closures with liaison, signage and other appropriate media and methods.

6.2.2 Traffic

Aspect:

Some restrictions to vehicular, cyclist and pedestrian traffic movements are likely during the construction of the scheme, particularly at tie-in locations and during the widening of the 12th Lock Bridge. In addition increased numbers of Works-related traffic, including material supply and removal and transportation of equipment and workers, will temporarily increase traffic demand on the approaches.

Impact:

There are no existing pedestrian facilities along the R120, and the situation will not improve until completion of the scheme.

Pedestrians, cyclists and vehicular traffic will be affected by the construction of the new roads. The effects are likely to consist, primarily, of delays and associated queuing. These effects may result in some drivers choosing alternate routes during construction, with the Outer Ring Road representing a

likely alternate route. Temporary diversions and delays to traffic may be an inconvenience to road users, particularly during the peak hours in the mornings and late afternoons. These negative impacts are predicted to be moderate. Deliveries to and from local businesses may be also be similarly affected.

Proposed Mitigation Measure(s):

- Two-way traffic flow will be maintained along sections of the Scheme during peak times for the duration of construction;
- Restrictions on traffic flow will be limited to hours outside of the morning and evening peak;
- Alternative routing will be provided where possible;
- Temporary traffic management arrangements will be required to include for pedestrians & cyclists;
- Road users and local residents will be forewarned of possible road closures with liaison, signage and other appropriate media and methods.

6.2.3 Third-Party Access Requirements during Construction

Aspect:

Construction activities may inhibit access to property, business premises and canal towpaths.

Impact:

Vehicular access to the northeast Canal tow path will be closed during construction. Access to the industrial property on the north east side of canal will not be required during the construction stage as this property is in the ownership of South Dublin County Council. Access to a private dwellings on the northeast side of Canal can be gained via Hayden's Link Road.

Southeast of the canal bridge a realigned access will be provided for the towpath and a private residence located along this tow path. This private residence will be required to use a temporary access through Grange Castle Business Park for the duration of the works on site.

Access to the northwest towpath will be maintained during construction. However, in the event that the 1932 bridge extension requires replacement, a temporary 'bailey' bridge will be required, which will be located immediately east of the proposed bridge extension. If a bailey bridge is required then northbound traffic crossing the temporary bailey bridge will be prohibited from turning left onto this towpath. Drivers wishing to use this access will have to approach the access from a northerly direction.

Access to the southwest towpath may be occasionally interrupted but temporary access to the adjacent private property will be provided as necessary.

Access to properties elsewhere along the R120 may occasionally be impacted by the works requiring temporary arrangements as the construction works proceed.

Proposed Mitigation Measure(s):

The Contractor will liaise with property owners in order to ensure that access is maintained as required to each individual property / residence. Works that temporarily impact with accesses will be undertaken at times agreed with each individual property owner so that that access is maintained as required to each individual property / residence.

6.2.4 Flora and Fauna

Aspect:

Construction of new roads through private or public lands and road reservation corridors including disturbance by contractor's site facilities.

Existing Environment:

There are no rare species of flora or fauna along the extent of the proposed road improvement works. An Ecology Report has been undertaken for the Scheme by Mr. Roger Goodwillie (MIEEM) and is presented as Appendix 4.

The Grand Canal is important as an aquatic habitat but has an additional value as a communication route for wildlife through the built-up area. It links small areas of habitat that have become separated by urban development and enriches or replenishes the wildlife that survives there. It is listed as a proposed Natural Heritage Area (Site Code 2104) though, in this state, it is not subject to the provisions of the Wildlife (Amendment) Act 2000.

At various places the Grand Canal contains species that are listed as of special conservation value in the EU Habitats Directive or are protected or listed by National legislation. These are as follows:

- Otter
- Badger
- Bats
- Desmoulins whorl snail Vertigo moulinsiana

- Brook lamprey
- Crayfish
- Opposite-leaved pondweed Groenlandia densa
- Myxas glutinosa

Impacts:

The only section of the route of ecological interest is the Canal itself arising from its role as part of a linear habitat. The R120 crossing point has no appreciable interest in vegetation though there is a possibility of summer roosting by Daubenton's bat.

Desmoulin's whorl snail does not occur in the area as far as is known and certainly not on the site of the works. If it was present downstream it could be sensitive like most aquatic animals to the changes of pH caused by concrete falling into the Canal and also to toxic chemicals from formwork release agents etc.

In their movements along the Canal otters may occasionally cross the R120 as there is no aquatic route through the 12th lock and or canal millrace.

Proposed Mitigation Measure(s):

In order to facilitate otters that may occasionally cross the R120, easy access to the towpath on each side of the bridge should be maintained on both the northern and southern banks of the canal. A permanent otter/badger pass is proposed, thereby providing safer and improved access.

It is proposed to install bat boxes under the new bridge thereby catering for seasonal roosting by the animals.

Strict anti-pollution measures will be specified for the construction works and the contractor's method statements will be required to be approved beforehand. The works will also be closely monitored by the Employer's site staff.

Strict measures will be adopted to prevent material from embankments entering the Canal during the construction phase.

Residual Impact

There is no impact to the Grand Canal pNHA or to the organisms contained within it during the construction phase following implementation of the proposed mitigation measures.

6.2.5 Soil & Groundwater

Aspect:

Spillage and\or leakage of petrochemicals from petrochemical storage facilities, construction vehicles etc. onto soils.

Existing Environment:

According to Geological Survey of Ireland Bedrock Map (Sheet 16, 1995) the local bedrock is the Upper Carboniferous aged Limestone known as Calp, generally described as dark grey to black shaley limestone and shales and is gently dipping (10-30deg) in this area.

Site investigations confirmed the presence of limestone bedrock beneath the site to at least 15m below ground level, the maximum depth of the investigation. Bedrock is described as strong to locally moderately strong, thin to medium bedded (locally laminated), grey to dark grey, fine-grained, argillaceous Limestone. Bedrock was conclusively reached at depths of 3.5m to 4.4m with an upper approximately 1m thick weathered zone of angular gravel sized argillaceous Limestone above the solid bedrock. Clay smeared fractures were found within bedrock.

The site investigation results indicate that topsoils are comprised of approximately 30cm of brown sandy clay. Subsoils consist of firm brown sandy, gravely clay with cobbles and boulders.

The Calp is classified as a locally important bedrock aquifer that is moderately productive in local zones. Groundwater in the Calp is typically calcium magnesium bicarbonate hard water.

During the site investigation, shallow perched groundwater was encountered within the sandy, gravely Clay at depth of 0.8 to 1.5m below ground level. Groundwater was encountered within the upper weathered bedrock at a depth of 2.6 metres. The groundwater level subsequently rose to 1.6m below ground level. There is no record of water encountered within bedrock to 15m below ground level.

A search of the GSI well records database within 2km of the proposed route indicates that there are no private wells recorded. Local dwellings and businesses along the proposed route are serviced by water mains.

Impacts

- the underlying soils and aquifer may be at risk from accidental spillages of oils and chemicals that could contaminate soils and groundwater.
- suspended solids from earthwork activities could enter receiving waters causing pollution.

Proposed Mitigation Measure(s):

The impact to the soil and underlying groundwater is predicted to be neutral provided the following mitigation measures are implemented.

- Topsoil excavated as part of the works shall be reused in reinstatement and landscaping.
- A Pollution Control Plan shall be in place for the construction stage. The plan shall incorporate measures such as:
  - Minimisation of the area and period of time that soil will be exposed;
  - Designating appropriate locations and methods for storing soils/aggregates and for any oils/lubricants and other potentially polluting substances involved in road construction;
  - Inspection/certification to ensure that vehicles are leak free prior to access to site;
  - Use of temporary sediment trapping/settling devices;
  - Re-vegetating/stabilising exposed areas as soon as practicable
  - An emergency plan to deal with accidental spillages.

6.2.6 Water

Aspect:

There is no surface water drainage system in existence at present along the stretch of the R120 south of the canal. Run-off from this section of the road flows into a selection of ditches, which eventually flow into the Griffeen River.

Surface water drainage to the north of the canal consists of road gulleys and surface water sewers. Surface water is discharged to the Grand Canal millrace in the vicinity of the 12th Lock Bridge.

The only significant watercourses to be crossed are the Grand Canal and canal millrace in the townland of Ballymakaily. There are a number of open ditches running parallel to the existing R120 and the Grand Canal and one culverted ditch, which runs beneath the existing road. The open ditches running along the Grand Canal will be reinstated where possible.

Impacts

- Interference with, or cutting off of, existing land drains and ditches where they are crossed.
- Scheme works in the vicinity of the Grand Canal may negatively impact on the existing canal environment.

Proposed Mitigation Measure(s):

- Where the ditches along the R120 are crossed it will be necessary to construct culverts so as to maintain their purpose.
- All construction works adjacent or over the Grand Canal will require the use of shielding to avoid any contamination from construction activities. A **Pollution Control Plan** shall be in place for the construction stage as described in 6.2.5.
- Surface water to the north of the canal will discharge to the River Griffeen. No surface water drainage will discharge to the millrace, which is the current situation pertaining at this location.

6.2.7 Air and Noise

These impacts include noise, vibration and lighting.

Noise

Aspect:

Generation of noise near residential and commercial premises during working hours by the operation of construction vehicles and equipment and by trucks travelling from construction sites.

Impact(s):

There may be noise nuisance impact to residences in the vicinity of the Scheme. These negative impacts will be of short-term duration.

Proposed Mitigation Measure(s):

- Construction activities taking place outside the period between 8.00am and 7.00pm must receive written permission from the Construction Stage Engineer and South Dublin County Council. This excludes the pumping out of excavations, security and emergency works;
- Construction vehicles and equipment will be properly maintained;
- Equipment used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- All vehicles and equipment will where appropriate, be fitted with exhaust silencers.

Vibration

No perceptible impacts caused by vibration are predicted during the construction phase.

Lighting

Aspect:

Night-time security lighting at the contractor's site facilities may be provided near residences.

Impact(s)

If contractor's site facilities are located in close proximity to residences there may be a slight short-term light disturbance.

Proposed Mitigation Measure(s):

- Light impact from the contractor's site facilities will be minimised.
- Lighting will be directed onto the contractor's site facilities and work surfaces and away from adjacent residences to minimise any potential impact.

6.2.8 Climate\Air Quality

Aspect:

The prevailing wind in Ireland is from a quadrant centred on west-southwest. These are relatively warm winds from the Atlantic and frequently bring rain. Easterly winds are weaker and less frequent and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

The prevailing wind direction for the area in the proximity of the route is between south and west. Wind characteristics vary between a gentle to moderate breeze throughout the year. Annual average wind speeds range between 8.7 and 14.1 knots with highest wind speeds occurring during winter months. Lowest wind speeds occur in the June, July and August period. On average there are approximately 20.3 days per year with gales. The mean yearly precipitation level is 711.4mm. The mean yearly temperature for the area is 9.3^0C. The month showing the highest average temperature is July with a temperature of 15.2^0C. The lowest average monthly temperature of 4.6^0C occurs in February.

The greatest threat to the existing climate conditions in Ireland is from greenhouse gas emissions and global warming. According to the National Climate Change Strategy the Republic of Ireland

emissions of greenhouse gases in 1990 were equivalent to 55.6 million tonnes (Mt) of CO_2. Actual figures from 2004 indicate that emissions of greenhouses gases in Ireland were 23% above the 1990 levels. It is predicted that without the measures outlined in the National Climate Change Strategy this figure could rise to 37% by 2010.

Impacts

There are no perceptible impacts on climate during the construction phase. There may be a dust impact on nearby residences, however this impact may be a slight nuisance or imperceptible.

Proposed Mitigation Measure(s):

- Frequent dust suppression will take place on exposed soil surfaces;
- Stored materials emitting dust will be covered when not in use;
- Dust monitoring will take place at sensitive industries whose activities and\or products may be negatively impacted on.

6.2.9 Landscape

Aspect:

Change of landscape due to construction activities during the building of new roads.

The rural countryside topography surrounding the site is predominately low-lying with very little difference in the overall ground levels. Most field patterns in the area are separated by unkempt, traditional hedgerows, which are low in vegetative diversity.

Within this environment, the Griffeen River has been re-directed and culverted, and flows in several branches on a predominantly north-south axis from Newcastle, northward to Lucan where it enters the River Liffey.

The low elevation of the surrounding area, and lack of rising contours, provides distant views to the Wicklow Mountains in the south and east, while a combination of existing trees and built structures in the surrounding landscape terminate lines of sight in other directions.

The surrounding area is dominated by large tracts of agricultural land, which are slowly being subsumed by expanding urban development. Vegetation cover in the area is limited to the series of hedgerows in varying states of repair, and the tree and shrub cover of private gardens and entrances to farm complexes. The hedgerows found within the surrounding agricultural fields are dominated

by traditional hedgerow species including *Ilex aquifolium* (Holly), *Rosa canina* (Dog Rose), and *Rubus fruticosa* (Bramble). Hedgerows lining the R120 consist of mainly *Fraxinus excelsior* (Ash), *Crataegus Monogyna* (Hawthorn), with the afore-mentioned species intermixed. Several occurrences of mature *Quercus robur* (Oak) are also found alongside the R120. The Grand Canal is lined on either side by broadleaf planting consisting predominately of *Ilex aquifolium* (Holly) and relatively young *Populus spp.* (Poplar) stands.

Several factors affect the scale and amount of views in the surrounding area. Such factors include:

- topography being generally flat,
- the location of mainly overgrown and tree-lined hedgerows,
- existing residential development, and
- the nature of employment in the area being confined in the most part to large industrial complexes at the north end of the scheme, with little opportunity for views into the surrounding landscape.

Overall views of the surrounding area are mainly contained to the short (<0.75km) and medium ranges (up to 1.6km).

Impacts

The construction phase of the project in general will have a moderate negative impact on the nearby receptors, as this will result in the addition of construction machinery, intermittent road closures, an increase in dust, and other temporary structures being added to the landscape and viewed throughout the process. The removal of existing vegetation is also an impact undertaken during construction.

A temporary bailey bridge may be required trio cross the Grand Canal during the construction phase. This structure and associated earthworks and removal of existing vegetation will have a negative impact upon the Grand Canal Landscape and views from adjacent residences during the construction phase.

Proposed Mitigation Measure(s):

In the landscape design, the re-instatement of robust tree lines and hedging will be included.

6.2.10 Material Assets

These impacts include public utilities (gas, water, drainage, electricity, telecommunications etc.) and property.

Public Utilities

Aspect:

Potential disruption of electricity, water, gas or water services to residential and commercial premises under planned and unforeseen conditions.

Impacts:

The impact may be an inconvenience to residential and commercial premises.

Proposed Mitigation Measures:

- Road works will be carried out by contractors working under the supervision of the relevant utility company to ensure conformity to technical specifications and standards as well as to minimise the interruption of service;
- When disruption is planned, affected residences and industries will be forewarned of disruptions to services using signage in public places and other appropriate media;
- When disruption is unplanned, the disrupted service will be repaired as soon as practicably possible.

Property

Aspect:

Proposed road works may have a negative impact on property. There is a direct impact on two properties, which will be removed as part of the scheme.

Impact:

Removal of residential dwelling with resultant impact on residents.

Proposed Mitigation Measure(s):

One of these properties is currently vacant in the ownership of South Dublin County Council. It is envisaged that the second property will be acquired by South Dublin County Council.

6.2.11 Cultural Heritage

A Cultural Heritage Impact Report of the proposed Scheme was undertaken by Courtney Deery Heritage Consultancy and is presented as Appendix 3. This Report assessed the likely impact of the proposed Scheme and offers recommendations for the mitigation of such impacts.

No features of an archaeological nature were identified during the course of the Cultural Heritage Impact Report.

Architectural Heritage and Cultural Heritage structures identified during the course of the Cultural Heritage Impact Report are located in the immediate vicinity of the 12th Lock. There structures include

a) 12th Lock
b) 12th Lock Bridge
c) Two residential properties

Aspect:

Any development, which includes topsoil and subsoil stripping, reduction of ground levels and excavation, can potentially have a negative impact on archaeological and cultural remains both recorded and unrecorded.

Impact:

The proposed works may impact on a structure thereby resulting in it being physically removed, either wholly of partially.

There will be no impact on the 12th Lock.

There will be no impact on the 1775 Arch structure component of the 12th Lock Bridge. There may be an impact on the 1932 bridge extension, which may require to be replaced.

There will be a direct impact on two residential properties in the vicinity of the 12th Lock. Both of these properties are considered to be of local architectural heritage but do not have protected structure status.

Proposed Mitigation Measure(s):

Cultural Heritage Impact Report of the proposed Scheme was undertaken by Courtney Deery Heritage Consultancy and is presented as Appendix 3.

Proposed mitigations measures include:

a) Monitoring by a licensed archaeologist of groundworks during the construction phase.
b) Protect, maintain and preserve the original (arch) bridge structure.
c) Re-use stone and cappings from the existing parapets in the new design.
d) A photographic survey of the 12th Lock Bridge will be undertaken prior to works being undertaken.
e) The aesthetics of the existing bridge will be improved by use of a high quality finish utilising limestone cladding.
f) A conservation specialist will be employed to oversee the works to the 12th Lock Bridge and to liaise with the Conservation Officer of South Dublin County Council.
g) A photographic survey of the canal lock has taken place as part of Cultural Heritage Impact Report. Prior to any works commencing the existing walls of the structure will be surveyed.
h) A photographic survey of residential property on the north side of the canal has been undertaken as part of Cultural Heritage Impact Report. A similar photographic survey will be undertaken of the residential property on the south side of the canal.
i) An old field gate, which will be removed by the proposed works, has already been photographed and its location marked on a map. No further mitigation measures are considered necessary.
j) A disused cast-iron water pump/fountain will be removed in advance of construction and retained by South Dublin County Council.

6.3 Operational Phase

Predicted environmental aspects, impacts and mitigation measures associated with the operation of the Scheme are given in this section.

6.3.1 Human Beings

Employment

No perceptible negative impacts on employment are predicted during the operational phase.

Vehicular and Pedestrian Traffic and Community Severance

Aspect:

Alteration of traffic flow patterns as a result of the operation of the Scheme and impact on pedestrian and cycle movements in the vicinity of the Scheme.

Impact(s):

There will be no change to traffic flows patterns as a result of the Scheme.

There will be new pedestrian and cycle facilities included in the Scheme. Pedestrian crossing facilities will be provided immediately north of the Pitch and Putt Course and at the 12th Lock Bridge. The pedestrian crossing facilities and new footpath and cycletracks will provide greatly improved and safer conditions for road users, cyclists and pedestrians using the R120 and also pedestrians and cyclists using the Grand Canal Green Route. The proposed scheme will therefore have a positive effect in meeting the travel and access needs of those living and working in the wider area.

Proposed Mitigation Measure(s):

None

6.3.2 Flora and Fauna

No perceptible impacts on fauna and flora are predicted during the operational phase.

6.3.3 Soil

Aspect:

Drainage of dirty runoff water from new road surfaces into the surrounding environment during the operation of the new roads.

Impact(s):

The potential impacts of the proposed road improvement works during operation include:

- An impact may result from contamination of surface and groundwater resources downstream of land occupied by the new roads. If unmitigated, this negative impact will be cumulative and therefore moderate, notably if dirty water enters tributary systems. Surface water discharge from the site will be to the River Griffeen, which discharges to the River Liffey at Lucan and ultimately to Dublin Bay. A number of Natura 2000 sites are located in Dublin Bay, which could be impacted by the operational phase of the proposed road scheme. A Stage 1 Screening Report for Appropriate Assessment in accordance with the requirements of Article 6(3) of the EU Habitats Directive has been prepared in support of the Part 8 Planning Procedure for the proposed road improvement scheme. The report finds that the proposed scheme, either individually or in combination with other plans and

projects, will not give rise to significant effects on the integrity of any Natura 2000 sites in Dublin Bay. The Stage 1 Screening Report is included as Appendix 5.

- The construction of cuttings may result in surface runoff with the potential to erode the slope face and wash out the fines in the slope.
- The impedance or interference with surface water drainage could have a negative effect on embankment slope stability.
- There is the potential to increase groundwater vulnerability in the cut area, enabling quicker access of road-based contaminants directly into groundwater. However, the removal of soil from the area will not result in any change in groundwater classification.
- Discharge of pollutants from motor vehicles to the Grand Canal, the canal millrace or the River Griffeen.

Proposed Mitigation Measure(s):

- The R120 Improvement will involve the construction of surface water gulleys, surface water sewers, attenuation measures and oil interceptors. Two separate outfalls to the River Griffeen will form part of the Scheme, with no discharge to the Grand Canal or canal millrace, which is currently the situation. Because of this the overall impact is predicted to be positive.
- Runoff from upgraded and new road surfaces will pass through an oil interceptor so as to eliminate any contamination of the surface water system.
- Attenuation of the surface water network will be incorporated into the scheme design to ensure that all surface water discharges to receiving watercourses do no exceed current flows.
- De-icers and herbicides will be applied according to the manufacturer's instructions having particular regard to application rates.
- A Maintenance Procedures Manual for the completed road drainage system, including procedures for routine maintenance of gulleys, surface water pipes, silt traps and oil interceptors, will be prepared and issued to South Dublin County Council for adoption and incorporation into their annual road maintenance programme.
- An emergency plan will be in place for containing accidental spillages.

6.3.4 Water

A description of the existing environment can be seen in section 6.2

Impacts

The proposed road will result in a slightly increased run-off but this is carried in a closed drainage system to the outfall.

Proposed Mitigation Measure(s):

The Griffeen River is the main watercourse in the surrounding area and has the capacity to accommodate the proposed runoff from the proposed R120 Improvement Scheme. Surface water attenuation will be provided to limit discharge to current levels.

6.3.5 Air and Noise

A description of the existing environment can be seen in section 6.2

Impacts

Noise

Aspect:

Noise will be generated by the operation of vehicular traffic on the improved roads.

Impact(s):

The proposed road improvement works will remove the traffic lights at the 12th Lock Bridge. Traffic noise currently associated with traffic stopping and starting at this location, including increased engine noise etc, will be greatly reduced as a result of the proposed road improvement scheme.

A new road surface will result in reduced wheel noise from traffic on the R120.

The proposed road improvement scheme will therefore have a positive impact on noise in its vicinity.

Proposed Mitigation Measure(s):

None

Vibration

No perceptible impacts caused by vibration are predicted during the operational phase.

Proposed Mitigation Measure(s):

None

6.3.6 Climate\Air Quality

Aspect:

Increased levels of traffic on the R120.

Impacts

The proposed road improvement scheme provides improved safety for road users, including pedestrians and cyclists. The proposed road improvement scheme will not induce increased levels of traffic on the R120.

The proposed road improvement scheme will not result in any increase in traffic. The removal of the traffic lights at the 12th Lock Bridge will eliminate stop/starts that currently occur at this location, thereby reducing vehicle emissions and resulting is a positive impact for air quality.

Proposed Mitigation Measure(s):

No scheme specific mitigation required.

6.3.7 Landscape

Aspect:

The existing landscape will change due to road infrastructure.

Impacts

The proposed scheme involves improvement of the existing R120 over the extent of its current alignment. The proposed improvement works are primarily on the line of the existing road so the only change to the landscape will be to hedges and trees along the R120.

The existing landscape has proved to be capable of accommodating the current R120. If integrated using appropriate landscaping measures, the road improvement scheme will have a *minor-to-negligible landscape impact* on the surrounding environment.

Proposed Mitigation Measure(s):

A landscape design will be carried out to replace hedgerows and trees over the extent of the scheme and to and reinstate the character of the existing R120.

6.3.8 Material Assets

No perceptible impacts on material assets are predicted during the operational phase.

6.3.9 Cultural Heritage

No impacts on Cultural Heritage are predicted during the operational phase.

6.4 Summary of Predicted Environmental Impacts

Predicted environmental impacts during the construction and operation phase are summarised in Table 6.1. The significance of impacts is assessed under unmitigated and mitigated circumstances.

Table 6.1. Summary of predicted environmental impacts

Environment	Abbreviated Aspect \ Impact	Positive/ Negative/Neutral	Duration	Significance (unmitigated)	Significance (mitigated)
CONSTRUCTION PHASE					
Human beings	Job creation and generation of income	Positive	Short term	Slight	Slight
	Job losses to existing business	Negative	Permanent	None	None
	Road and pedestrian footpath closure causing delays and nuisance	Negative	Short term	Slight	Slight
Fauna and flora	Disturbance of ecology in the path of new roads	Negative	Permanent	Little	Little
Soil	Spillage of petrochemicals and resultant soil contamination	Negative	Short term	Slight	Slight
	Incorrect storage and disposal of hazardous waste; resultant soil contamination	Negative	Short term	Slight	Slight
	Sterilisation of topsoil in the path of new roads	Negative	Permanent	Moderate	Slight
Water	Contamination of runoff by petrochemical spillage	Negative	Short term	Slight	Slight
	Contamination of runoff by hazardous waste	Negative	Short term	Slight	Slight
Air	Noise disturbance to residential and business premises	Negative	Short term	Nuisance	Slight
	Light disturbance to residential and business premises	Negative	Short term	Slight	Slight
Climate/air quality	Dust disturbance to residential and business premises	Negative	Short term	Nuisance to imperceptible	Slight to imperceptible
Landscape	Visual change of road corridor due to construction activities	Negative	Short term	Moderate	Moderate
	Visual change of existing roads due to construction activities	Negative	Short term	Slight	Slight
Material Assets	Disruption of public utilities (electricity, water etc.)	Negative	Short term	Slight Significance if loss of earnings to businesses	Slight
	Road works infringe onto private land resulting in severance	Neutral and negative	None	None	None
Cultural heritage	Impact on archaeological and cultural remains both recorded and unrecorded	Negative	Permanent	Moderate	Slight

Environment	Abbreviated Aspect \ Impact	Positive/ Negative/Neutral	Duration	Significance (unmitigated)	Significance (mitigated)
OPERATIONAL PHASE					
Human beings	Alteration of traffic flow patterns	Positive	Permanent	Improvement	Improvement
Fauna and flora	No perceptible impacts				
Soil	Drainage of dirty water runoff from new road surfaces into soils	Negative	Permanent	Moderate	Slight
Water	Drainage of dirty water runoff from new road into water resources	Negative	Permanent	Moderate	Slight
Air	Road noise disturbance to nearby residential and business premises	Positive	Permanent	None	None
	Road light disturbance to nearby residential and business premises	Negative	Permanent	Slight nuisance	Slight nuisance
Climate/air quality	No perceptible impacts				
Landscape	Visual change of land from Agricultural / road reservation corridor to road infrastructure	Negative to neutral	Permanent	Slight	Slight
Material assets	No perceptible impacts				
Cultural heritage	No perceptible impacts				

7 Conclusions

The proposed Adamstown Road (R120) Improvement Scheme takes place predominantly on the line of the existing road, the R120. Where it deviates from the existing road it travels on existing agricultural land, which is Zoned EP2 (To facilitate opportunities for manufacturing, research and development activities) or through a road reservation corridor.

It is important to note that environments surrounding and occupied by the Scheme are zoned EP2 and therefore will possibly be disturbed by future infrastructure and commercial activities.

If the impacts are mitigated, then there will likely be no significant reduction in quality of life for human beings or the environment as a consequence of construction and operation of the Adamstown Road (R120) Improvement Scheme.

There will be no impact on Natura 2000 sites within 15km of the scheme or on Natura 2000 sites in Dublin Bay.

The proposed bridge extension works and the mitigation measures which will be in place will ensure that there is no impact to the Grand Canal pNHA.

Appendix 1 – 12th Lock Bridge Inspection Report

12th Lock Bridge Inspection

Inspection Report

Rev B
July 2012

Client:
Carrol & Browne Consultants
10 The Square
Kilcock
Co. Kildare

Consulting Engineer:
Roughan & O'Donovan
Arena House
Arena Road
Sandyford
Dublin 18

12th Lock Bridge, Adamstown

Inspection Report

Document No:..... 12.166.10/IR

Made: ..... Peter King

Checked: ..... Joe Kelly

Approved: ..... Marc Jones

Issue	Description	Made	Checked	Approved	Date
Rev B	Inspection Report	PK	JK	MJ	July 2012

12th Lock Bridge, Adamstown

Inspection Report

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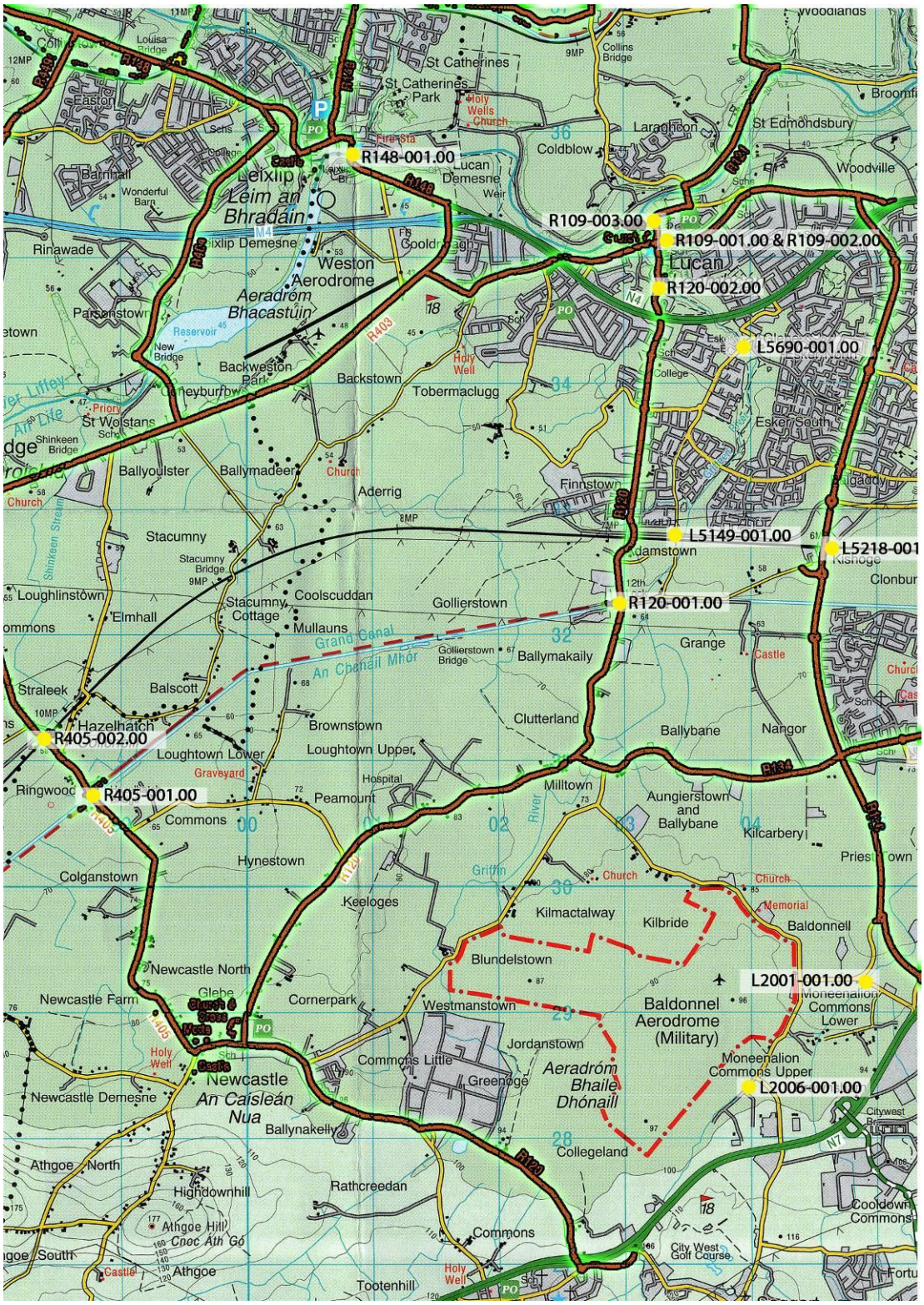
1.0 LOCATION PLAN



12th Lock Bridge labelled R120-001.00

2.0 INTRODUCTION

Roughan & O'Donovan Consulting Engineers were appointed by Carroll and Browne Ltd, in an email from Mr Ger Browne to Mr Joe Kelly (Roughan & O'Donovan) on 25th June 2012, to carry out a detailed inspection of all structural elements of the 12th Lock Bridge in Adamstown.

The scope of work indicated that Roughan & O'Donovan were required to carry out the following works;

- A close visual inspection of the entire structure and detailed photographic survey of all structural elements and noted defects carried out in accordance with the EIRSPAN manuals and BD21/01 "Assessment of Highway Bridges and Structures".
- The compilation of an Inspection Report containing all information included in the Eirspan Principal Inspection Report and a comment on the feasibility of incorporating the existing bridge elements into any proposed widening scheme.
- A Stage 1 Structural Assessment was **not** included in the scope of works.

3.0 DESCRIPTION OF STRUCTURE

The masonry arch section of 12th Lock Bridge was constructed circa 1770 and widened to the east with a reinforced concrete slab in 1932. The structure carries the R120 Lucan Newcastle Road over the Grand Canal at Adamstown Co. Dublin. A location plan for the structure is included in Section 1.0 of this report. The bridge carries the road across the canal in an approximate north / south orientation. Photographs illustrating the general arrangement of the bridge are provided as Appendix A.

The bridge comprises a 6.07 metre single span masonry arch structure widened to the east with a reinforced concrete slab giving an out-to-out width of approximately 7.9 metres. The bridge carries a 5.73m wide carriageway with a 0.9m footway along the east side. A one way stop-go system currently exists over the bridge.

4.0 INSPECTION

The Inspection of the bridge was carried out on Tuesday 26th June 2012 by Mr Peter King of Roughan & O'Donovan. Weather conditions were overcast with an ambient temperature of approximately 21^{O}C. The inspection included a detailed visual examination and photographic record of all accessible elements of the structure as viewed from the canal banks and carriageway.

4.1 Component 1: Bridge Surface

The bridge surfacing was observed to be in reasonably good condition with no evidence of rutting, settlement or loss of surface texture (see Photo 1). However, gouged areas of surfacing were evident near the crown of the arch (see Photo 2). These marks are as a result of long wheelbase vehicles grounding on the crown of the arch due to the hump-backed profile of the bridge. This issue does not appear to have resulted in any damage to the arch barrel but should be addressed as part of any future regrading of the carriageway. Also noted were 2 no. isolated cracks in the

carriageway surfacing at the east side of the bridge. 1 no. 1m long transverse crack in the carriageway possibly corresponding with the back of the abutment or slab of the widened section and 1 no. 2.5m long longitudinal crack approximately 2m in from the east parapet (see Photo 3). These cracks do not appear to be manifestations of more serious structural issues in the superstructure or substructure and therefore are not considered significant at this time. Both cracks should be sealed with hot poured bitumen as part of routine maintenance.

4.2 Component 2: Expansion Joints

Not applicable.

4.3 Component 3: Footways / Median

A 0.9m wide concrete footway is provided along the east side of the carriageway. The footway is in reasonable condition with only minor surface cracking and slight degradation of the kerb noted (see Photo 4). No footway is provided on the west side of the bridge. Concrete haunching protecting an unknown service is evident at the base of the west parapet at the crown of the arch. There is evidence of services running through the footway also.

4.4 Component 4: Parapets / Guardrails

Both parapets are roughcast rendered and have semi circular granite copings. Parapets are 340mm wide and approximately 1.0 and 0.8 metres high above the adjacent footway / carriageway level at the east and west respectively. No calculations were carried out to confirm the containment capacity of the parapets, however by inspection; they do not comply with either the geometric or containment requirements of the BD 52/07, "The Design of Highway Bridge Parapets".

The dressed granite coping blocks are missing from both ends of the east parapet and the unit at the north end of the west parapet is displaced. Otherwise the parapets are in good condition (see Photos 4-6).

4.5 Component 5: Embankments / Slopes

Grass and light vegetation on embankments adjacent to the bridge are well controlled.

4.6 Component 6: Wing Walls / Retaining Walls

The canal training walls are of square cut limestone masonry construction and were found to be in good condition with only occasional open joints requiring repointing and minor vegetation clearance required. The spandrel wall on the west elevation of the structure is covered in a concrete render and shows no evidence of structural distress (see Photos 7 and 8).

4.7 Component 7: Abutments

Inspection of the abutments showed that there were no signs of flexural cracking, rotation or differential settlement which would be indicative of structural distress due either to overload or movement of the substructure. The abutments are generally well pointed with only isolated areas of leakage and open joints noted below the arch springing points on both abutments. A small quantity of repointing is required at these locations. Due to the water level in the canal, no scour survey could be carried out and the lower parts of the abutments were not amenable to inspection (see Photographs 9 and 10).

4.8 Component 8: Piers

Not applicable.

4.9 Component 9: Bearings

Not applicable. The reinforced concrete extension appears to be cast directly onto concrete capping beams which sit on the stone masonry abutments.

4.10 Component 10: Deck / Slab

The 460mm thick arch barrel appears to be in good condition with no evidence of structural distress noted. The arch shape is good and there is no evidence of any structural defects in the form of cracking, deformation or displaced arch voussoirs (see Photo 11). The entire soffit of the arch has been repointed in the past with only occasional open joints requiring repointing evident. Some seepage has occurred through the joints to most of the arch barrel, resulting in calcified areas and staining. Furthermore there is evidence of active leakage through some joints in the arch barrel. This issue however is not considered to be significant in terms of the capacity of the structure. No calculations were carried out to determine the load carrying capacity of the bridge; however, given the very shallow depth of fill over the arch (less than 50mm at the crown) it is very unlikely that structure would meet the full load capacity requirements of BD 21/01.

The reinforced concrete section of the superstructure appears to be in reasonably good condition (see Photo 12). However, concrete spalling with exposed reinforcement was noted in 2 no. locations along the west edge of the deck soffit at the interface with the masonry arch (see photo 13). Due to their location, these defects are likely to be as a result of differential movement between arch and the concrete slab and the extent of the damage is unlikely to be significant in terms of the structural capacity of the slab; however, further testing would be required to establish whether they are symptomatic of more significant problems with the concrete and / or steel reinforcement. Furthermore, these defects pose a long term durability issue and therefore concrete repairs are necessary to restore the desired level of cover to the reinforcement. Minor cracking to the render on the east elevation was also noted.

4.11 Component 11: Beams / Girders / Transverse Beams

Not applicable.

4.12 Component 12: Canal Bed

No inspection of the canal bed adjacent to the bases of the abutments has been carried out to check for erosion or scour, however there is limited scope for scour to occur at canal bridges.

4.13 Component 13: Other Elements

There is evidence of numerous services and utilities crossing the bridge. There is a service chamber in the east footway and in the carriageway at the base of the west parapet and a marker plate on the southeast embankment reads "10 no. ESB 110 KV Ducts Depth 0.9m". A service chamber on the southeast tow path is marked "Public Lighting" and there are also numerous overhead lines in the vicinity of the bridge.

4.14 Component 14: Structure in General

As referred to above, it is very unlikely that structure would meet the full load capacity requirements of BD 21/01 and the parapets do not comply with modern design standards. However, the general condition of the structural elements of the bridge was found to be very good with no evidence of structural distress noted anywhere.

Minor defects were observed in relation to:

- 2 no. spalled areas on the soffit of the concrete deck;
- Minor repointing required to the arch barrel, abutments and wingwalls;
- Gouging and cracking of the bridge surfacing;
- Missing coping units on the east parapet;
- Minor cracking in the footway;

These and other minor defects are described in Sections 4.1 to 4.13 of this report. It is considered that these defects are not significant enough at this stage to warrant major intervention works. However, they should be addressed as part of the long term maintenance of the structure.

In conclusion, based on the visual inspection carried out, the bridge did not exhibit any structural defects that would indicate that it is under significant structural distress under current loading. In this regards it is recommended that a Stage 1 Structural Assessment be carried out to determine the current load carrying capacity of the structure and verify that it is suitable for retention and incorporation into the proposed bridge widening scheme.

APPENDIX A – PHOTOGRAPHS

Photograph 1: General View of Carriageway Surfacing

Photograph 2: Gouging at Crown of Arch

Photograph 3: Longitudinal Crack in Surfacing

Photograph 4: East Footway and Parapet

Photograph 5: Missing Granite Coping Block at NE Corner

Photograph 6: West Parapet

Photograph 7: Canal Walls

Photograph 8: West Elevation

Photograph 9: South Abutment

Photograph 10: North Abutment

Photograph 11: Soffit of Arch Barrel

Photograph 12: Soffit of Concrete Deck

Photograph 13: Spalling on Edge of Concrete Deck

Appendix 2 – Criteria Used for the Rating of Environmental Impacts

Criteria used for the rating of environmental impacts are described as follows

Human Beings

Employment

Significant
Where the demographic structure of a population would be fundamentally altered as a result of one or more categories of population living or working in an area (e.g. young persons seeking first home, middle sized family units, office workers) moving into the area to live/work, or departing from there as a direct result of the road scheme.

Moderate
Where the demographic structure of an area would be noticeably altered as a result of the scheme such that, for example the workforce, households (such as apartment dwellers) are predicted to be added to\taken from the current populations but without fundamental changes in demographic profile.

Slight
Where any alteration to the demographic breakdown is incidental and no meaningful alteration to population and employment profiles is readily identifiable.

Vehicular and Pedestrian Traffic and Community Severance

No quantitative specialist studies have been undertaken on vehicular and pedestrian traffic. Predicted impacts are qualitative and are determined by professional judgement.

Community Severance

Significant
People are likely to be deterred from making trips to an extent sufficient to induce a re-organisation of their habits. This would lead to a change in the location of centres of activity or in some cases to a permanent loss to a particular community. Alternatively, considerable hindrance may be caused to people trying to make their existing journeys.

Moderate
Where pedestrians or drivers are likely to be dissuaded from making some trips by reason of the fact that trips are made longer or less attractive.

Slight
The current journey pattern is likely to be maintained, but there may probably be some hindrance to movement.

Flora and Fauna

The significance of ecological impacts depends on both the rarity of the habitats, flora and fauna potentially impacted by the proposed scheme, and on the type and duration of impacts which could arise from the proposed scheme. The degree of rarity of an ecological feature gives a rating of international, national, regional or local importance. Impacts are rated as significant, moderate, minor, or as being of no significance. Mitigation measures will reduce or minimise impacts.

Soil

Significant
Changes that would result in a permanent alteration to the quality or status of the soil, or cause difficulties to the regional spoil disposal capacity by virtue of the volume concerned. A significant impact is deemed to carry the same weight as a significant effect referred to in the EU Directive on Environmental Assessment.

Moderate
Temporary changes which may impact on the soil environment, e.g. construction works, demolition, excavation, pilling or dredging; or which could give rise to hazards or health through soil being disturbed, or the disposal of material categorised as hazardous waste in accordance with statutory provisions.

Slight
Localised effects, which can readily be investigated and\or designed out in the construction process, or by the disposal of contaminated but non-hazardous spoil in accordance with statutory provisions.

Water

Significant
Changes that would result in a permanent alteration to the quality or status of the water; major culverting and works affecting licensed abstraction points. A significant impact is deemed to carry the same weight as a significant effect as referred to in the EU Directive on Environmental Assessment.

Moderate
Temporary changes which effect the aquatic environment, e.g. construction works, piling or dredging.

Slight
Localised effects, which can readily be investigated and\or designed out in the construction process.

Air

No quantitative specialist studies have been undertaken on noise and vibration to enable comparative assessments with standards. No perceptible impacts caused by vibration are predicted during the construction or operation of the scheme. Noise impacts are assessed qualitatively and are predicted by professional judgement.

Lighting
Significant
Where the proposed level of public lighting would be less than the present level, or if the new lighting installation would result in permanent inconvenience such as causing glare. Where a new lighting regime improves the lighting environment.

Moderate
Where an occurrence of the above phenomena takes place on a temporary basis during the construction phase.

Slight\Neutral
Where no perceptible/just perceptible alteration to the present level of public lighting occurs.

Climate\Air Quality

Climate and air quality impacts are predicted by professional judgement.

Landscape

Profound
A profound impact is where an area of townscape, including open space, is obliterated, such as the destruction of a public garden or forecourt. It also applies to the complete townscape transformation of a location such as landscaping of an existing derelict area as a public open space.

Significant
A significant impact is where the character of the scheme visually dominates the character of the scheme corridor through which it passes; where an element or elements of the scheme physically affect/visually intrude on a contiguous townscape; or where the insertion of the scheme will visually alter a piece of high amenity landscape or townscape.

Moderate
A moderate impact is where the scale of the scheme corridor can comfortably accommodate the scale of the road insertion; where the visual quality of the contiguous landscape/ townscape is not high; and where existing visual elements are partially changed by the scheme.

Slight
A slight impact is where the scale of the scheme corridor visually dominates the schemes elements when inserted; where the visual quality of the contiguous landscape/townscape is poor or derelict; or where the visual impact of an element of the scheme system is very localised.

Material Assets

Predicted impacts are determined by professional judgement.

Appendix 3 – Cultural Heritage Report

COURTNEYDEERY
Heritage Consultancy

Adamstown Road (R120) Improvement Scheme

Cultural Heritage Impact Report

By Lisa Courtney
Courtney Deery Heritage Consultancy

For
South Dublin County Council

On behalf of
Carroll & Browne Consultants
Design & Management

12th July 2012

CONTENTS

Plates

1 INTRODUCTION

1.1 This report comprising a desk study and site survey assesses the archaeological and architectural heritage constraints associated with the on-line improvement of the existing Adamstown Road (R120).

1.2 This assessment collates archaeological and architectural heritage information and research that has taken place along the extent of the proposed road improvement to date and considers and assesses the recorded monuments and protected structures in proximity to the proposed works.

1.3 The objectives of this cultural impact report are to:

- assess and describe the receiving cultural heritage and historical environment;
- identify, evaluate and define where possible the cultural heritage constraints existing along the proposed road improvement works;
- recommend a mitigation strategy in order to minimise the impact on potential cultural heritage constraints along the route of the proposed improvement works.

1.4 To date this general area has been assessed from a cultural heritage perspective as part of the development of Grange Castle Business Park, and as part of the Green Pedestrian and Cycle Route from Inchicore to Twelfth Lock.

2 DESCRIPTION OF LANDS AND PROPOSED DEVELOPMENT

2.1 The proposed Adamstown Road (R120) Improvement Scheme and associated works extends from a point 0.5km north of the existing R120/ Nangor Road junction in the south to a point 0.3km north of the Grand Canal. It is approximately 1.2 km long and essentially follows the route of the existing road. The average width of the proposed scheme to the south of the bridge is 13.6m and consists of two footpaths, cycle tracks and two lane carriageway. The average width to the north of the canal bridge is 11.5m and consists of two shared pedestrian/ cycle tracks with a two lane carriageway.

2.2 The existing ground level approaching both sides of the 12th Lock Bridge will be raised as part of the proposed improvement works. This will enable a flatter approach to and from the bridge ensuring better visibility.

2.3 The existing 12th Lock Bridge (RPS 127 and NIAH 11204052) (ID 5), which is a protected structure, will be widened to the east to accommodate the proposed road improvement works. The bridge originally built c.1770 has been significantly altered by previous works during the 1930s which resulted in a doubling of its original width. The current width of the bridge is 8.130m and this will be extended to approximately 16.3m. The original stone arch (3.5m wide) on the western elevation will remain unaffected by the construction works.

2.4 The removal of two properties located (ID 3 and ID 4) to the northeast and southeast of the canal will be required as part of this road improvement scheme. These properties are considered to be of local architectural heritage merit but do not have protected structure status. South Dublin County Council has acquired the property to the north of the canal and this enabled an internal inspection of the property to take place.

3 METHODOLOGY

3.1 The archaeological, architectural and cultural heritage assessment is based on a desk study of documentary and cartographic sources. The desk study availed of the following sources:

- Record of Monuments and Places (RMP) Files
- Record of Protected Structures (RPS)
- Topographical Files of the National Museum of Ireland
- Excavations Bulletin, www.excavations.ie
- Cartographic Sources: Rocque (1760), Taylor (1816), the first edition six-inch (1837-43) Ordnance Survey map and the 1935-38 six-inch Ordnance Survey mapping
- South Dublin County Council Development Plan 2010-2016
- National Inventory of Architectural Heritage (NIAH) for South Dublin
- Previous archaeological and cultural heritage reports conducted for the lands at Grange Castle Business Park and Green Pedestrian and Cycle Route – these are listed in the reference section of the report
- Other documentary sources (listed in the reference section)

SITE INSPECTION

3.2 The route along which the road improvement works are proposed was inspected in June 2012, in dry favourable conditions. The purpose of the field inspection was to identify archaeological, historical/cultural heritage features and structures/features of architectural heritage merit that may be subject to direct or indirect impacts as a result of the proposed improvements and to produce a photographic record.

CONSULTATION

3.3 Consultation has taken place with the Architectural Heritage Advisory Unit (AHAU) of the Department of Arts, Heritage and the Gaeltacht and the Conservation Officer with South Dublin County Council.

ARCHAEOLOGY

3.4 The 2010-2016 South Dublin Development Plan recognises the potential to reveal below ground archaeological sites especially during the construction of large scale development or major infrastructure projects. An objective of the plan is to protect and enhance archaeological monuments and their settings.

ARCHITECTURAL HERITAGE

3.5 'Architectural heritage' is defined as all structures and buildings (together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings and sites), which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. Architectural heritage is generally visible and has a presence in the landscape which requires assessment (Architectural Heritage Guidelines for Local Authorities 2006). The Record of Protected Structures (RPS) was set up to protect structures determined to be of special interest and its effect is to seek to retain the special character and features that make these structures significant.

3.6 The management and protection of architectural heritage in Ireland is achieved through a framework of European and international conventions and national laws and policies (DAHGI 1999, 35). The Convention for the protection of Architectural Heritage in Europe (the Granada Convention, 1985) was ratified by Ireland in 1997. The Convention emphasises the importance of inventories in underpinning conservation policies. The National Inventory of Architectural Heritage (NIAH) was established to fulfil Ireland's obligations under the Granada Convention. A number of categories of special interest are taken into consideration when assessing the significance of a property/structure. These include architectural, historical, archaeological, artistic, cultural, scientific, technical or social.

CULTURAL HERITAGE

3.7 Cultural heritage is a general term used to describe aspects of the environment which are valued for their age, beauty, history or tradition. It encompasses aspects of archaeology, architecture, history, landscape and garden design, folklore and tradition and topography. Cultural heritage is expressed in the physical landscape in numerous often interrelated ways.

Townland names and the toponomy of an area can be valuable indicators of the type of cultural heritage within the local area.

4 DESCRIPTION OF EXISTING ENVIRONMENT AND PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

ARCHAEOLOGY

4.1. There are no recorded archaeological sites on the Adamstown Road (R120) over the extent of the proposed scheme. The closest recorded monument, the site of Adamstown Castle (DU017-029) is located over 200m to the north of the scheme and will be unaffected.

4.2 Archaeological assessments of the general area to date have included desk-based and walkover studies, a geophysical survey and test excavation and excavation of newly revealed archaeological features. Work to date has concentrated on the environs of Grange Business Park which is located immediately east to the proposed road improvement scheme.

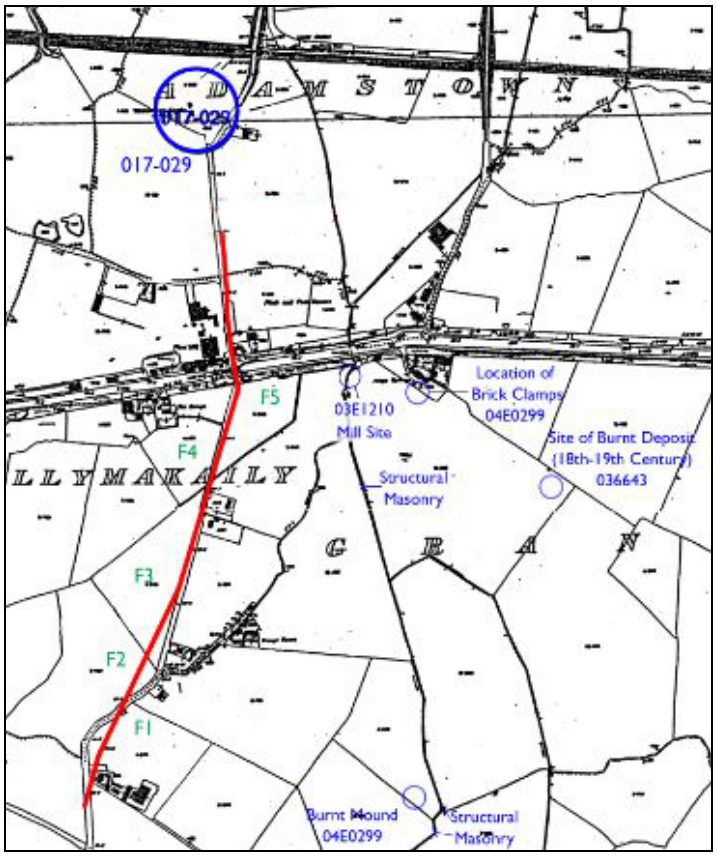


Figure 1: Proposed Road Improvement and RMP Location

ARCHITECTURE AND CULTURAL HERITAGE

4.3 There are five protected structures (RPS) and seven structures (the five protected structures plus two additional) recorded in the National Inventory of Architectural Heritage (NIAH) for South Dublin County Council located in the vicinity of the 12th Lock. There will be a direct impact to the 12th Lock Canal Bridge (RPS 127 and NIAH 11204052).

Table 1: *RPS Structures*

Map Ref No.	Address/Location	Description	Impact
RPS 118	12th Lock Grand Canal, Ballymakaily	Stone, two storey industrial building	No impact
RRS 119	Lock House, 12th lock Grand Canal, Ballymakaily	Victorian style house	No impact
RPS 120	Grange cottage, Grange, Clondalkin	Detached six bay, single storey farm house and outbuildings	No impact
RPS 125	12th Lock, R120 Road Lucan	Single-stage canal lock, 12th lock	Indirect impact
RPS 127	Leck bridge, 12th Lock Grand Canal, Ballymakaily	Bridge with stone capping	Direct impact

Table 2: *NIAH Structures*

Reference	Address/ Location	Description	Appraisal	Rating	Impact
11204052	12th Lock Bridge, R120, Ballymakaily	Single arch road bridge over canal, c. 1770. Segmental arch with painted dressed voussoirs stones set into smooth rendered west elevation. Roughcast rendered parapet with semi-circular coping stones and roughcast rendered pier faced with dressed granite blocks to each end. Bridge widened and refurbished in 1932.	This bridge, though widened, retains much original fabric and remains a valuable element in this group of canal structures including the lock gates and mill buildings.	Regional	Direct
11204056	Lock Keeper's Cottage, Ballymakaily	Detached three bay, two storey gabled fronted classical style former lock keeper's house, c.1765, now in use as a detached house. Timber sash windows. Roughcast rendered walls with cut stone architrave and string courses, with a round arched blind recess to the gable front. Pitched slate roof with red brick chimney stacks to each gable. Annexe to the east has a hipped slate roof, timber sash windows and timber panelled door with overlight.	This attractive former lock-keeper's house of a standard design retains much of its original architectural impact and style. The plain string courses and classical detail contrast with roughcast walls to a very pleasing effect. Possibly designed by Thomas Omer, it is a fine addition to the varied group surrounding the 12th Lock.	Regional	No impact
11204053	12th Lock, R120	Single-stage canal lock, c. 1770. Lock gates are of timber and iron	A good example of a standard-type 18th 0-century	Regional	Indirect impact

Reference	Address/ Location	Description	Appraisal	Rating	Impact
		construction with coursed granite inner walls. Painted timber mooring post at intervals between gates.	canal lock, enhanced by its setting among such a rich group of canal structures.		
11204054	South Dublin County, Ballymakaily	Detached seven bay two storey over basement former mill (water) building, c. 1860, now in use as offices. Random coursed rubble stone walls with roughly dressed limestone quoins. Replacement timber windows. Ground floor windows have a modern concrete surround with the original red brick relieving arches still visible. Seven large oval cast-iron building ties are located on the south front. Segmental profile corrugated iron roof.	Despite alteration and conversion, this former mill building associated with the Flour Mill still retains its elegance and dominance over the 12th lock and bridge, and is a valuable reminder of the former variety of functions associated with the canal network.	Regional	No impact
11204055	South Dublin County, Ballymakaily	Detached multiple bay three storey over basement former mill building, c. 1860, now derelict. Roughcast rendered walls. Smooth render to the centre bays on the ground floor showing outline of a former extension, now removed. A mix of boarded-up and steel-framed windows. Large door openings to ground floor of front elevation and west gable. Pitched corrugated asbestos roof.	This substantial former mill (water) building fronting onto the canal, though in poor condition, retains its imposing volume and some materials, and is a valuable document of the diversity of building functions and types associated with the canal network.	Regional	No impact
11208008	Milltown, Grange	This former building was a detached four bay, two storey farm house, c. 1850. Roughcast rendered walls. uPVC door and casement windows. Replacement pitched slate roof with terracotta ridge tiles and gable coping. Two central brick chimney stacks. Later drip moulding over northern front window. Lean-to extension to the rere, and shed to the side.	This structure was removed as part of a previous development in the area.	N/A	No impact
11204057	Grange Cottage	This cottage is a detached six-bay single storey farm house, constructed c.1810 with roughcast rendered walls with hipped roofs to	An attractive house, set alongside the lock within a complex of outbuildings. Adds character and is a	Regional	No impact

Reference	Address/ Location	Description	Appraisal	Rating	Impact
		the front elevation flanking an enclosed glazed porch with a lean-to roof of corrugated iron.	valuable element within the overall group of buildings.		

THE GRAND CANAL

4.4 The Grand Canal dates from the mid-eighteenth century and formed a crucial role in the industrial development of the rural landscape of the county. The canal began construction in 1756, following the passing of an Act in 1715, proposing a link between Dublin and the Rivers Shannon and Barrow. Interest waned, until 1755, when Thomas Omer, an engineer was finally appointed to the project. The building of the canal caused a major change to the landscape and the initial twelve mile stretch began at Clondalkin in 1756 and was completed in 1773. The earliest locks built by Omer at Clondalkin (11th lock), Adamstown Road bridge or Leck Bridge (12th lock) and Lyons (13th lock) were shortened and narrowed in subsequent years by John Trail and later still by John Smeaton to conform to the lock dimensions of the rest of the line. They were originally 137ft long and 20ft wide (41.75m -6.09m) but now have an unusual shape with the original lower gate recesses still visible today below the 11th and 12th locks. The primary considerations for the alterations were twofold, the large amount of water required to fill such locks, and the size of the boats suitable for the Irish canal trade. Smeaton argued that, as boats carrying upwards of 40 tons would be most suited to the volume of trade that could be expected on Irish canals, locks 60ft by 14ft (18.28m – 4.26m) would suffice (Delany 1973, 20). These became the standard dimensions of the Grand Canal.

THE 12TH LOCK, BRIDGE AND ENVIRONS

4.5 The 12th lock is a single-stage canal lock and is listed as a protected structure in the South County Dublin Development Plan (RPS:125). The lock gates, located to the west of the road bridge, are of timber and iron construction with coursed limestone inner walls. Painted timber mooring posts are situated at intervals between the gates.

4.6 The line of the canal, through both open country side and urban area, inevitably intersected many roads. Thus the construction of the canal required the erection of many bridges in order that existing roads would be carried over it and on the other hand to accommodate landowners whose land was bisected by it. The vast majority of the surviving eighteenth and early nineteenth century Irish canal bridges are single-span, masonry arched structures. However a number of Omer's early bridges on the Grand Canal near Clondalkin were constructed with timber, although these were removed when passenger services were first introduced, owing to their restricted headroom (Delany 1995, 22).

4.7 Two basic varieties of masonry arched bridge were built over the Grand Canal, the first, and more common, is the distinctive hump-backed, narrow-waisted bridge, which spanned both canal and towpath for example at Hazelhatch and Lyon's Estate (Aylmer Bridge). The second variety was used to span the tail of a lock chamber, where the fall of the ground was used to obviate the need for a steep approach ramp. This is the type of road bridge at the 12th Lock.

4.8 The road bridge, also known as the Leck Bridge, is a protected structure (RPS:127 and NIAH 11204052) and is contemporary with the construction of the canal lock. In 1932 the bridge was widened to the east and refurbished to allow for the widening of the Lucan - Newcastle Road at that time. The earliest section of the bridge is the segmental arched west elevation with dressed voussoir stones. The east elevation, dating to the 1930s is flat arched. Both east and west parapets are roughcast rendered and are topped with semi-circular coping stones.

4.9 The construction of the canal also precipitated the construction of additional associated industrial structures such as flour mills, water mills, mill races and warehouses, which took advantage of the direct link with Dublin and the midlands. A number of mills are located in the vicinity of the 12th lock and are marked on various map editions of the Ordnance Survey. The closest mill complex to the Canal was a flour mill located immediately to the northwest of the 12th lock. The flour mill structure (RPS 118, NIAH 11204054 and 11204055) survives to the present although it ceased to function as a mill a number of years ago. The Lock Keeper's house was built c.1765 by Thomas Omer and is a detached three bay, two storey gabled fronted classical style structure.

TOWNLAND NAMES

4.10 Townland names are an invaluable source of information not only on the topography, landownership, and land use within the landscape, but also on its history, the archaeological monuments and the folklore. Where a monument has been forgotten or destroyed, a placename may still refer to it, and may therefore indicate the possibility that remains may survive below the ground surface. Townland names were recorded by the Ordnance Survey surveyors in the 1830s and 1840s, when the entire country was mapped for the first time.

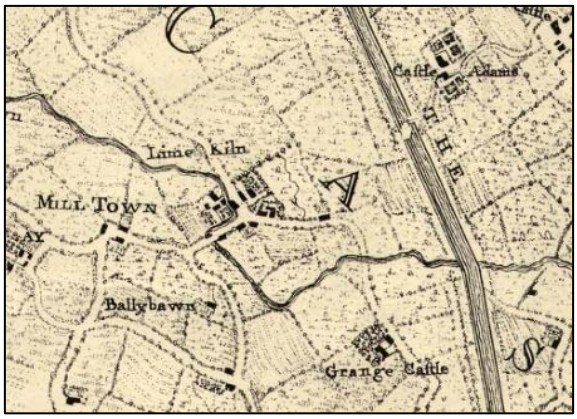
Table 3: *Townland Names - (Joyce 1923; 1995; www.logainm.ie)*

Townland	Barony	Parish	Irish Derivation	Meaning
Ballymakaily	Newcastle	Kilmactalway	*Baile Mhic Caollaí*	A charter of 1174 states that Henry II confirmed St Mary's Abbey's land to include'.Balimacheilmer.'
Grange	Newcastle	Kilmactalway	*An Ghráinseach*	Monastic outfarm
Adamstown	Newcastle	Aderrig	*Baile Adaim*	Named after Sir Adam de Hereford, the lord of

Townland	Barony	Parish	Irish Derivation	Meaning
				Leixlip who was granted land in the area after the Anglo-Norman conquest.

HISTORIC CARTOGRAPHIC ANALYSIS

4.11 ***John Rocque's Map of County Dublin 1760 (Figure 2)***



Rocque's map of 1760 is the first to depict the Grand Canal which began construction in the same year. It is named as the "New Canal" and the location of the 12th Lock would appear to correlate to the stretch of the canal just south of "*Castle Adams"* or Adamstown.

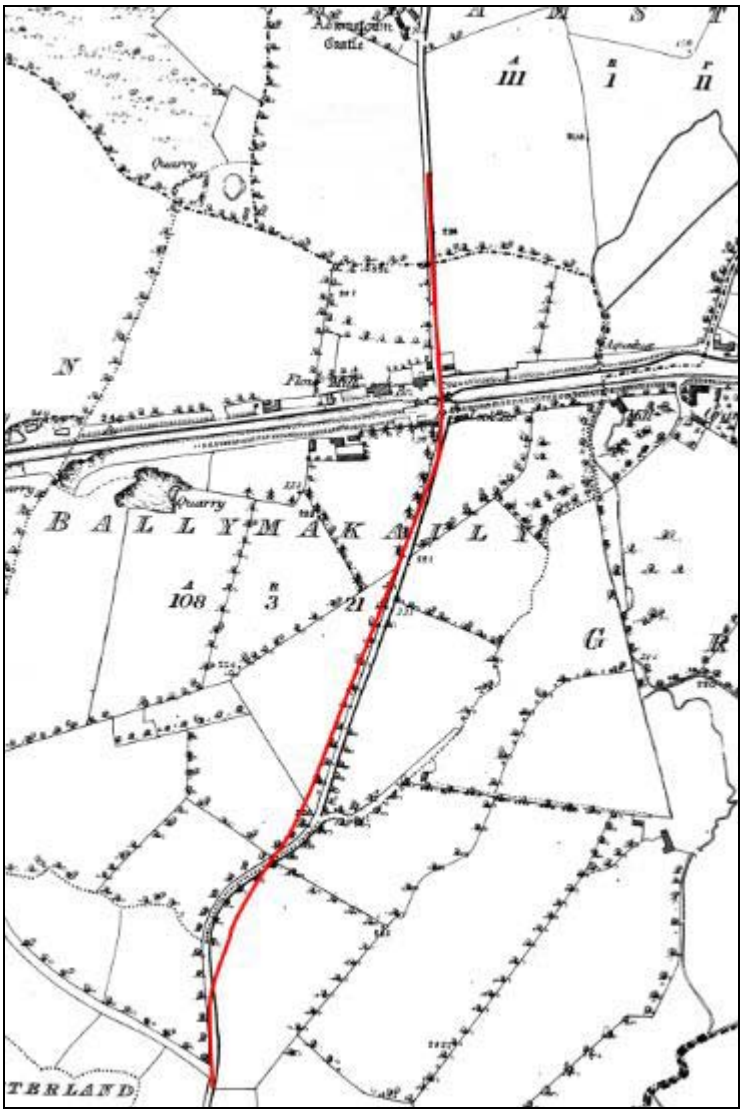
4.12 ***John Taylor's Exact Survey of the County of Dublin 1816 (Figure 3)***

Taylor's map dates to 1816 and unlike Rocque, names the bridges and locks of the Grand Canal. Taylor indicates 'mills' on the northern bank of the canal, west of the 12th Lock. The map also shows a road leading to the mill from the south, roughly along the existing R120.

4.13 ***First edition Ordnance Survey Map 1837-43 (1:10, 560 scale) (Figure 4)***

The road travelling through the 12th lock is oriented in a north-south direction and divides open pasture fields some lined with trees. The 12th Lock Bridge is located in the townland of Ballymakailly. This is a road bridge, corresponding to the present R120 and is annotated as Br. (it is listed as a protected structure, RPS:125). A small rectangular structure is located to the east of the bridge on the southern bank of the canal and to the northeast a linear structure is shown fronting onto the canal. On the northern side of the canal, west of the bridge, an industrial building listed in the record of protected structures (RPS:118), is shown on this OS edition as a

Flour Mill. The 12th Lock is located adjacent to Leck Bridge and it is also listed by South Dublin County Council as a protected structure (RPS:125).



4.14 ***Revised edition Ordnance Survey Map (1:10, 560 scale)***

The revised edition Ordnance Survey maps of 1873 and 1935-8 shows little change in the settlement pattern along the road with only a small number of additional properties being built. The field pattern also remained largely unchanged. The 'Heelstone of Upper Gate' is marked on the 1873 map and presumably refers to the canal lock. On the 1935 map Adamstown Castle is noted as being 'in ruins'.

5 SITE INSPECTION

5.1 A non-invasive site inspection of the proposed road improvement scheme was conducted in June 2012 on two consecutive days. The proposed road improvement scheme generally follows the line of the existing R120 and diverges slightly from the current line of the road in three places where it encroaches on flat, open pasture fields. The proposed improvement works involve the removal of sections of roadside hedges comprising earthen banks and overgrown ditches in this area. The focus of the site inspection was around the 12th lock where the improvement scheme will require the widening of the 12th Lock Bridge and the removal of two structures to the north and south of the bridge (Table 4 and Figure 5). The inspection of structures or buildings is based on external elevations only apart from one structure to the north of the bridge where internal access was gained.

Table 4: *Site Inspection Survey*

ID No.	Protected Status	Structure Description	Impact
ID 1	RPS120; NIAH 11204057	Grange Cottage	No impact
ID 2	N/A	Two cut stone arches	No impact
ID 3	N/A	Single storey, five bay detached cottage	Direct impact
ID 4	N/A	Two storey over basement dwelling	Direct impact
ID 5	RPS 127; NIAH 11204052	Leck Bridge with stone capping	Direct impact
ID 6	RPS 125; NIAH 11204053	Single-stage canal lock, 12th lock	Indirect impact
ID 7	N/A	2 storey, 3 bay structure	No impact
ID 8	RPS 118; NIAH 11204054	Former mill building	No impact
ID 9	NIAH 11204055	3 storey over basement former mill	No impact
ID 10	RPS 119; NIAH 11204056	Victorian style Lock House	No impact
ID 11	N/A	Gate	Direct impact-relocate
ID 12	N/A	Cast iron pump	Direct impact-relocate

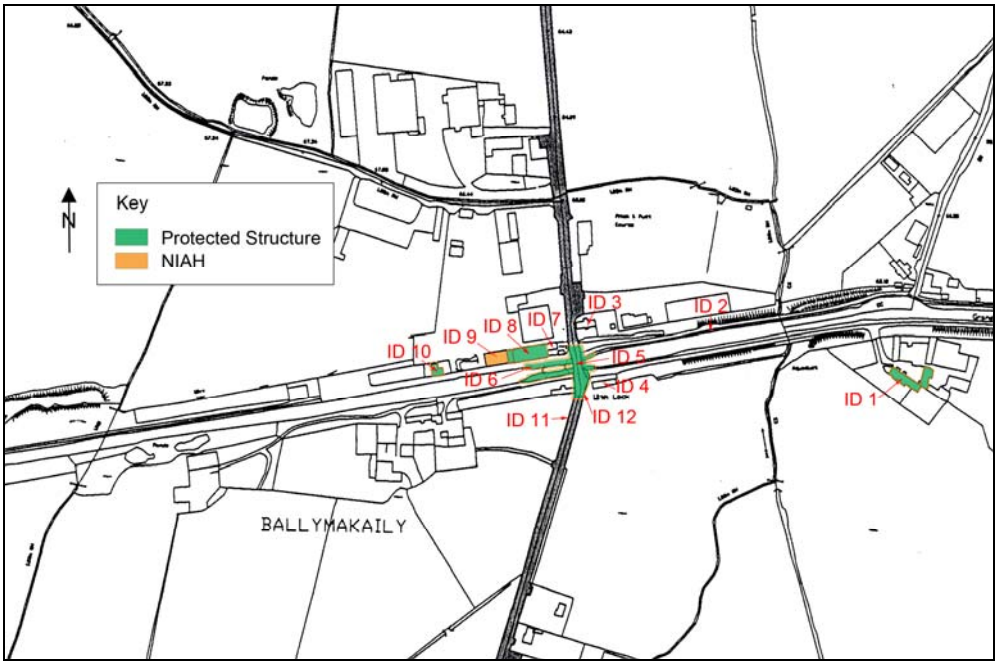


Figure 5: Location of Surveyed Structures

THE 12TH LOCK (DESCRIBED FROM EAST TO WEST)

5.2 **ID 1** - To the east of the 12th Lock, Grange Cottage is located on the south bank of the canal in the townland of Grange. The cottage (Plate 1) is a detached six-bay single storey farm house, constructed c.1810 with outhouses. The house is listed as a protected structure by South Dublin County Council (RPS: 120) and given a regional rating by the National Inventory of Architectural Heritage (11204057). It is accessed via the south eastern towpath of the canal or alternatively can be assessed via Grange Castle Business Park. It will not be affected by the proposal road improvement scheme.

Plate 1 Grange Cottage taken from the south

5.3 **ID 2** - On the northern bank of the canal, there are two cut stone arches located underneath the northern towpath enabling the flow of water from the millrace to re-enter the canal. The western arch is a simple segmental arch comprising of cut dressed limestone, while the eastern arch is

also a segmental arch, with a keystone located in the centre. This feature will remain unchanged as a result of the proposed road improvement scheme.

5.4 **ID 3** - A single-storey, five bay structure, detached cottage now unused, built circa 1820, is located to the north of the bridge on the east side of the canal (Plate 2). A later single-storey extension is attached to the east side and a modern glazed porch (now removed) was positioned on the south elevation. A one roomed, flat roofed extension is located to the rear of the building. The façade has a roughcast finish and the original sash windows have been replaced by casements.

Plate 2 Property (ID 3) to the north of the bridge, taken from the south west showing the front elevation with window opes and porch. This photograph was taken in 2006.

5.5 The structure is presently unused and all the opes are boarded up. The exterior presents as a homogenous build as it has a roughcast finish throughout, the only obvious extension is located to the eastern end of the build and this is due to the change in height of the building. The pitched roof is covered with asbestos tiles and has three rendered chimney stacks with wooden eves to ridge ends. The west side elevation fronts onto the road.

5.6 The house is depicted on the first edition and subsequent revised OS editions. Site inspection corroborates the historical map evidence and confirms that on-site interventions have impacted negatively on the building integrity. Significant changes in composition with additions to the north and east of the original dwelling/farmhouse and unsympathetic interior alterations have detracted from the significance of this structure. This structure will be removed as part of this proposed road improvement scheme.

5.7 A photographic survey has been undertaken of this property, which has been submitted to South Dublin County Council.

5.8 **ID 4** - A two-storey over basement structure possibly early-nineteenth century in date is located on the south side of the canal to the east of the 12th Lock (Plates 3-7). It is four bays wide and has a white-wash façade. The ground floor window openings have replacement timber casements. A

loft-storey window is positioned on both end gables. The single-span pitched roof is covered with modern tiles and roof lights have been inserted on both sides of the pitch. The roof has a central red brick chimney.

Plate 3 Structure taken from the northeast (ID4)

Plate 4 Front elevation (ID 4)

5.9 A later extension has been added to the front elevation of the dwelling. A basement opening is located on the west elevation. The west end of the structure appears originally to have functioned as a separate, but adjoining outbuilding.

Plate 5 Rear of structure (2006)

Plate 6 Rear of ID4

Plate 7 ID4 from northwest

5.10 The property is bounded on the west and north sides by a rubble stone wall and access is gained from the canal tow path. The dwelling is indicated on the first and revised edition OS mapping. This structure is deemed to be of architectural heritage and a social interest. This structure is scheduled for removal as part of the proposed improvement scheme.

5.11 **ID 5** - The 12th Lock Bridge, also known as "Leck Bridge", is a single arched road bridge, originally constructed c.1770 (Plate 8). The earliest section comprises a segmental headed arch with painted dressed voussoir stones set into smooth rendered west elevation.

Plate 8 Original arch, west side of bridge, dating to c.1770

5.12 The bridge was widened (doubled) and refurbished in 1932 (Plate 9). It is listed as a protected structure by South Dublin County Council (RPS: 127) and given a regional rating by the National Inventory of Architectural Heritage (11204052).

Plate 9 Plaque dating and naming the bridge

Plate 10 Flat arched concrete extension to bridge

Plate 11 Leck Bridge from the east

5.13 The east elevation, dating to the 1930s is flat arched concrete addition (Plates 10-11). Both east and west parapets date to this time and are roughcast rendered and are capped with semi-circular coping stones. There are eight coping stones left in-situ on the eastern parapet. It is flanked by roughcast rendered piers at either end (approx. 0.9m high, 1.20m long and 0.5m wide), each dressed with granite blocks. In recent times the capping stones at both ends of the eastern parapet have been removed (Plates 12-13). The bridge is considered to be of interest from an architectural and technical view point.

Plate 12 Eastern bridge parapet from the west

Plate 13 Eastern elevation taken from the east

5.14 **ID 6** - The 12th lock is located within the townland of Ballymakailly and is a single-stage lock, with coursed limestone walls and limestone coping. The gates are constructed of replacement timber and iron at the eastern and western ends of the lock and they are flanked with coursed limestone inner walls (Plate 14). There are painted timber mooring posts at intervals between the lock gates.

Plate 14 The 12th lock chamber taken from the west

5.15 This lock was constructed *c.*1770 and it is listed as a protected structure by South Dublin County Council (RPS: 125) and given a regional rating by the National Inventory of Architectural Heritage (11204053). It is a good example of a standard type eighteenth century canal lock. It, along with the 10th and 11th locks, is one of the three earliest locks constructed along the Grand Canal. All three canal locks have a distinctive 'bellied' shape due to the original dimensions undergoing alterations at a later date. The canal lock mechanism is located to the west of the bridge. The lock is considered to be of architectural and technical interest.

Plate 15 Northern lock wall, east of the Leck Bridge

Plate 16 Southern lock wall, east of Leck Bridge

5.16 The lower walls of the canal lock to the east of the bridge are shown in Plates 15 and 16. These walls will be left in-situ and will be under the proposed bridge extension.

5.17 **ID 7- 10** - Apart from the Canal Bridge and Lock there is a collection of interesting industrial structures located on the north-western side of the canal which provide an historic setting for the canal (Plate 17). These buildings will not be affected by the proposed road improvement works. A seven-bay two storey over basement former mill building, constructed *c.*1860 is currently in use as offices (ID 8). This mill is listed as a protected structure by South Dublin County Council (RPS: 118) and given a regional rating by the National Inventory of Architectural Heritage (11204054). To the west of the above mentioned mill building, a much larger detached three storey over basement former mill is located, dating to *c.*1860. This structure is not a protected structure, however it is listed by the National Inventory of Architectural Heritage (NIAH 11204055) and is attributed a regional rating of architectural heritage merit (ID 9).

Plate 17 View to mill buildings to the northwest of Leck Bridge

5.18 **ID 7** - A two storey, three bay, unpainted rough-cast faced structure is located north of the canal and west of the bridge. A porch with a side entrance is attached to the front, south-facing elevation. The original sash windows have been replaced by casements. The roof is hipped at the sides and retains the original natural slate covering. The front site is bounded by a hedge and modern gate. A number of later corrugated iron sheds are located to the eastern side of the house (Plate 18). These sheds may be removed as a result of proposed road improvement works.

Plate 18 View from the east to a two story structure with associated corrugated iron sheds, fronting onto the canal.

5.19 **ID 10** - The Lock Keepers Cottage of the 12th Lock of the Grand Canal is located on the northern bank of the canal to the west of the industrial mill buildings. It is a detached three-bay two storey, gable-fronted classical style former lock keeper's house, constructed c.1765 and is now uninhabited. The house is listed as a protected structure by South Dublin County Council (RPS: 119) and given a regional rating by the National Inventory of Architectural Heritage (11204056).

5.20 Tarmac tow paths flank both sides of the canal (Plates 19-20). The tow path to the south of the canal has been upgraded in recent years with a cycle path and information notices for amenity usage.

Plate 19 Tow path to the north of the canal, east of bridge

Plate 20 Towpath to the south of the canal east of bridge

5.21 **ID 11 & ID 12** - Other features of an architectural heritage interest along the R120 route are a wrought iron vernacular gate providing access into a field (Plate 21), and a disused water pump/fountain (Plate 22) both items located on the east side of the road, south of the bridge. The cast iron pump/fountain is composed of a cylindrical shaft with a fluted upper section, which was a standard design c. 1900. The cap has been replaced with concrete and the arm of the pump/fountain is missing.

Plate 21 Gate (ID 11)

Plate 22 Pump/fountain (ID 12)

5.22 There were no other discernible features of archaeological or architectural heritage merit present at the 12th Lock.

6 CONCLUSIONS AND RECOMMENDATIONS

ARCHAEOLOGY

6.1 There are no recorded archaeological sites along the proposed Adamstown Road (R120) Improvement Scheme and no visible archaeological features were identified during the field inspection. The lands flanking the east side of the R120 have been subjected to geophysical survey, archaeological testing and monitoring (Section 7 references 'Previous archaeological work in the environs of the Adamstown Road (R120) Improvement Scheme') and no potential archaeological features have been revealed.

RECOMMENDATIONS – ARCHAEOLOGY

6.2 Monitoring by a licensed archaeologist of groundworks during the construction phase will be an adequate mitigation measure to assess if there is a presence of soils, features or deposits of an archaeological nature that may survive below ground.

6.3 The attention of the South Dublin County Council is drawn to National Monuments legislation (1930–2004), which states that in the event of the discovery of archaeological finds or remains, the National Museum of Ireland should be notified immediately. Provision must be made to allow for, and fund any, archaeological work that may be needed if any remains should be noted after topsoil removal. As described above, if features are revealed, the area will need to be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or alternatively avoided.

ARCHITECTURAL HERITAGE AND CULTURAL HERITAGE

6.4 An impact occurs where a structure lies in the path of the proposed scheme and will be physically removed, either wholly or partially, as a result. The proposed road improvement impacts the following structures:

12thLock Bridge (ID 5)

6.5 The existing bridge will be widened to the east to accommodate the proposed improvement works. The bridge is of *c.*1770 origin and has protected structure status. However, the bridge has been significantly altered by a previous widening during the 1930s which resulted in a doubling of its original width. The earliest section of the bridge is the segmental arch on the west elevation which will be unaffected by the proposed works. Much of the remainder of the bridge, including both parapet walls, date to the 1930s. While the proposed bridge widening may involve the removal of the 1930s bridge extension; it will not impact upon the earlier western side. The priority is to protect, maintain and preserve the original bridge structure while ensuring the impact is minimized to safeguard the continued use of the bridge. The 1930's parapets and the

original stone capping will have to be taken down as part of the proposed works. It is proposed that the stone capping and cut stone will be reused where appropriate in the new design.

6.6 The potential for increased amenity use with the new provision of footpaths and cycle paths, linking local communities to the canal area is expected to have a positive affect and heighten the respect and awareness of the historic buildings and structures.

Canal Lock (ID 6)

6.7 The canal lock, located to the west of the bridge, is a protected structure. It will be indirectly impacted as the setting of the structure will be altered. The proposed widening which runs to the east of the bridge will not directly effect the canal lock structure. The canal structure to the eastern side of the bridge has previously been impacted by the widening of the bridge in the 1930s and any further alteration to its structure is considered not to be a severe impact. The original lower gate recesses of the original lock dimensions now visible under the 1930's flat arch bridge will remain insitu but will be under the proposed bridge extension. While no longer visible from above the feature will remain unaltered and physically unaffected by construction works.

Properties/Features Scheduled for Removal

6.8 Two properties (ID 3 & 4) located to the northeast and southeast of the canal bridge are scheduled for removal as part of the proposed improvement works. These areas will facilitate the widening of the existing embankments and will provide the necessary space for a new egress from the Pitch and Putt course to the north of the bridge. These properties are not protected structures and are considered to be of local architectural heritage merit.

6.9 None of the boundary walls belonging to properties that flank the existing R120 are of architectural heritage merit. There is an old field gate (ID 11) located to the southeast of the bridge which will be removed as part of the proposed improvement works. It is considered to be of local architectural heritage merit. A small disused water pump/fountain (ID12), also located to the south of the bridge on the eastern side of the existing road, will be removed as part of the proposed improvement works. This is considered to be of local architectural heritage merit and it is intended that it be retained by South Dublin County Council.

RECOMMENDATIONS – ARCHITECTURE AND CULTURAL HERITAGE

6.10 Recommendations are based on the architectural heritage merit of a structure or building, and whether this necessitates its preservation, either by avoidance, by re-routing or as a record of the past. None of the structures subject to impact i.e. those which will be removed by the proposed scheme, are of sufficient architectural heritage merit to require avoidance as part of the mitigation strategy.

12th Lock Bridge (ID 5)

6.11 A photographic survey of the bridge has taken place as part of this report and prior to any works it is recommended that a record of the existing structure be made. This record should detail features such as stone work, coping stones etc and take the form of a laser scan or photogrammetric survey. Fully rectified elevations should form part of the deliverables for a record of the past. This record comprising a targeted survey and the photographic record survey will be deposited in the Irish Architectural Archive and the Conservation Officer for South Dublin County Council.

6.12 There is an opportunity to improve the aesthetic of the existing bridge by ensuring that the new intervention is of a high quality finish and design and that the impact is minimized. With regard to the proposed bridge extension it is recommended that the facing of the new structure be composed of limestone cladding to match the existing canal retaining wall. Lime mortar should be utilized in the cladding and the existing half-round capping stones should be reused and form the top of the new parapet. The new intervention while reflective of the historic environment should be unapologetic and easily recognisable from the existing structure. It would be preferable if the new bridge structure could reflect the historic characteristics of the Grand Canal bridges (Plates 20 and 21) and on this occasion be left unrendered exposing the stone cladding and use similar stone material. It may be necessary to employ a conservation specialist to oversee the works and liaise with the Conservation Officer of South Dublin County Council.

Plate 23 Canal bridge at Lyons Estate

Plate 24 Canal bridge at Hazelhatch

6.13 On completion of the bridge extension a plaque should be placed on the bridge detailing the date and nature of these extension works. This was undertaken for previous works carried out at the 12th Lock Bridge in 1932.

Canal Lock (ID 6) and tow paths

6.14 A photographic survey of the canal lock has taken place as part of this report and prior to any works it is recommended that the existing walls of the structure are surveyed. This record should detail features such as stone work and take the form of a laser scan or photogrammetric survey.

Fully rectified elevations should form part of the deliverables for a record of the past. This record comprising a targeted survey and the photographic record survey will be deposited in the Irish Architectural Archive.

6.15 The impact to the towpaths to the east of the canal lock is considered minimal, they will have to be reinstated for public access use and no mitigation measures from a cultural heritage view point are necessary.

Properties/features Scheduled for Removal

6.16 Two properties are scheduled for removal and are considered to be of local architectural heritage merit (Figure 5). Both properties have been photographed to provide a record of the past for report purposes. At Property ID 4 external elevations were recorded, while at Property ID 3 internal and external elevations as well as the immediate surroundings were recorded. The gate to the rear of the Property ID 3 and the front entrance gate should both be removed and reinstated to a safe and appropriate location once the works are complete. This information should be deposited with the Irish Architectural Archive and an internal survey should take place at Property ID 4.

6.17 The old field gate, ID 11, which will be removed by the proposed works, has already been photographed and its location marked on a map. No further mitigation measures are considered necessary. The disused cast-iron water pump/fountain, ID12, should be removed in advance of construction and retained by South Dublin County Council.

6.18 As none of the boundary walls impacted by the proposed road improvement works are of architectural heritage merit mitigation is not considered necessary.

6.19 All recommendations with regard to Architectural and Cultural heritage are subject to approval from the Architectural Heritage Advisory Unit of the DAHG and the Conservation Officer of South Dublin County Council.

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World Wide Web (June 2012)

The location of Recorded and Registered Monuments were examined on this website: www.archaeology.ie

Archaeological excavations were reviewed on this website: www.excavations.ie

Townland names and place-names were reviewed on this website: www.logainm.ie

Ordnance Survey mapping and aerial photographs were browsed on this website: www.osi.ie

National Inventory Architectural Heritage Building Survey was reviewed on this website: www.buildingsofireland.ie

South Dublin County Council's web site was reviewed in relation to archaeology, architectural heritage (the record of protected structures) and cultural heritage information: www.southdublincoco.ie

Appendix 4 – Ecology Report

Adamstown Road (R120)

Improvement Scheme

Ecology

Prepared for Carroll & Browne Consultants

August 2012

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1. INTRODUCTION

This report has been prepared to examine possible ecological impacts of the proposed R120 Road Improvement Scheme including bridge works at the 12th Lock, with regard to any rare species of flora and fauna, to the proposed Natural Heritage Area (Grand Canal) and the group of European sites in Dublin Bay – the outflow of the Canal system and the River Griffeen/Liffey. These are

Site Name	*Designation*	*Site Code*
South Dublin Bay	candidate SAC	0210
South Dublin Bay-Tolka estuary	SPA	4024
North Dublin Bay	candidate SAC	0206
North Bull Island	SPA	4006

In this way it takes account of the provisions in the Wildlife Act (1976) and its Amendment (2000), the EU Habitats Directive and Birds Directive. It also provides data for an appropriate assessment to be undertaken by the Planning Authority.

The report is written by Roger Goodwillie MIEEM who has been involved in several of the projects on the adjoining Grand Canal (Green Route) and who visited the site again in July and August 2012. A short description of the immediate area is given at the outset for background detail.

Fig.1.Location of road improvement scheme

2. DESCRIPTION OF SITE

2.1 Flora and Vegetation

2.1.1 Bridge site

The 12th Lock was originally a long lock but was shortened before the Canal was opened to navigation. The bridge crosses the eastern part of it, over high (but now dry) lock walls made of cut limestone, while both lock gates lie upstream. The bridge itself was first a narrow hump-backed structure and this was widened by a concrete extension. At the same time the road was raised by embankments on each side to give a more level road profile.

The planned improvement works broadly follows the present route of the R120 with the addition of a new road embankment to cater for an eastern extension of the bridge over the Canal. The improved road alignment runs through an old cottage and garden before crossing the tailrace of a mill upstream. Shrubs dominate this part of the route with garden roses, snowberry *Symphoricarpos albus*, cypress and lilac in the garden and elder and brambles behind. In the remaining open space the Canadian fleabane *Conyza multiflora* has taken hold, along with rose-bay *Chamerion angustifolium* and a little prickly lettuce *Lactuca serriola*. The tailrace is overgrown with brambles *Rubus fruticosus* and butterbur *Petasites hybridus*, leading to reeds *Phragmites australis* in the less shaded conditions downstream.

On the southern side of the tailrace three medium-sized sycamore occur and then the species beside the towpath, i.e.

Arrhenatherum elatius	false oat
Poa pratensis	smooth meadowgrass
Achillea millefolium	yarrow
Heracleum sphondylium	hogweed
Anthriscus sylvestris	cow parsley
Crepis vesicaria	beaked hawksbeard

There is no sign of Japanese knotweed in the garden or on the Canal bank. This is an invasive species which is subject to the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011 and has to be treated properly to prevent its spread.

The bridge crosses over walls with a few transient plants blown in from the surroundings. At water level a line of liverworts and mosses occurs with scattered plants of wild angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria* or wood false brome *Brachypodium sylvaticum*. The bryophytes include

Pellia epiphylla	overleaf Pellia
Concephalum conicum	snakewort
Platyhypnidium riparioides	long-beaked water-feather moss
Syntrichia intermedia	intermediate screw-moss
Schistidium apocarpum	sessile Grimmia
Hygroamblystegium tenax	fountain feather-moss

Fig. 2. Northern side of Canal at bridge widening site

Fig. 3. Southern side of Canal at bridge widening site

The Canal itself contains little vegetation because of turbulence below the lock. Upstream and downstream the common aquatic plants are

Hippuris vulgaris	marestail
Sagittaria sagittifolia	arrowhead
Callitriche cf *stagnalis*	water starwort
Nuphar lutea	yellow waterlily
Potamogeton gramineus (floating)	shining pondweed
Sparganium emersum	unbranched bur reed

The branched bur reed *Sparganium erectum* grows in the marginal fringe of vegetation together with reed sweet grass *Glyceria maxima,* wild angelica *Angelica sylvestris,* marsh valerian *Valeriana officinalis, watercress Rorippa nasturtium-aquaticum* etc.

On the southern side of the Canal the verges of the towpath are similar to the north though black medick *Medicago lupulina* and hedge cranesbill *Geranium pyrenaicum* put in an appearance.

2.1.2 Adjoining road

South of the bridge there is a continuous 2-3m hedge on the eastern side of the road, formed of elder *Sambucus nigra,* hawthorn *Crataegus monogyna* and privet *Ligustrum vulgare* (Figure 4) The verge at its base consists of

Elytrigia repens	scutch
Poa pratensis	meadowgrass
Senecio erucifolius	hoary ragwort
Potentilla reptans	cinquefoil
Lathyrus pratensis	meadow vetchling
Ranunculus repens	creeping buttercup
Galium verum	lady’s bedstraw

On the opposite side of the road a hedge is lacking at first but it reappears along the course of the realignment, consisting mostly of ash at 3m high. Further south the proposed alignment leaves the existing line to run on a already acquired section beside a metal paling.

There is no habitat on the northern side of the bridge where existing paved and built areas are involved.

Fig. 4. Hedge on southern side to be partly removed

The new route heads slightly east of the present road at first with a new embankment in the corner of an intensive pasture now overgrown by thistles *Cirsium arvense*. The route rejoins the existing old road through the hedge (and blackthorn *Prunus spinosa*) just north of the first house and garden

2.2 Fauna

The lock basin has specialised invertebrates due to the prevailing turbulence though the shelter of the walls allows winged insects to fly and be preyed upon by sand martins and swallows. Daubenton's bat (the water bat) has been noted along this stretch of the Canal (Kelleher 2009) and may occasionally roost in the stonework. The stone arch of the Canal and millrace were examined in July/August 2012 but there was no evidence of bat presence then. No droppings were found and the few likely cavities were covered by spider's webs. Other bat species probably feed among the trees and bushes in the garden on the northern side.

One larger cavity in the lock wall contained an old bird's nest, probably that of a wagtail.

The millrace is a shallow stream of 1-2m width with a sand and gravel base for the most part but also an inclusion of fine mud. Algae are prevalent but the habitat is good for freshwater crayfish with tree roots and natural cavities along the edges. Some were seen, along with a few stone loaches. There was evidence too of past otter usage of this stream.

Fig 5. Trees around garden on NE side of bridge – potential bat feeding area

3. ROUTE EVALUATION

The only bit of the route of ecological interest is the Canal itself and this is really only for its role as part of a linear habitat. The crossing point has no appreciable interest in vegetation though there is a possibility of summer roosting by Daubenton's bat. Tree growth on the northern side is also likely to be used by other bats (common & soprano pipistrelles).

There are no rare species of flora or fauna on the bridge site though some do occur in the Canal upstream and downstream. The pondweed *Potamogeton gramineus* is currently unknown in Dublin though it has been recorded in the past on the Liffey (Doogue et al 1998). The presence of floating material at 12th Lock implies that it may be found growing higher up the Canal and possibly inside the County.

The hedges along the southern section of the realignment are typical of this part of the County and do not contain species of special interest. However they will be replaced by landscaping measures included in the scheme. Any species temporarily displaced will return to the new structures.

Fig. 6. Stone-arched section (1775) of bridge with potential cavities for Daubenton's bat

4. GRAND CANAL

4.1 Important species

The Grand Canal is important as an aquatic habitat but has an additional value as a communication route for wildlife through the built-up area. It links small areas of habitat that have become separated by urban development and enriches or replenishes the wildlife that survives there. It is listed as a proposed Natural Heritage Area (Site Code 2104) though, in this state, it is not subject to the provisions of the Wildlife (Amendment) Act 2000.

At various places it contains species that are listed as of special conservation value in the EU Habitats Directive or are protected or listed by National legislation. These are as follows:

4.1.1 Otter

Otters are well known in the Canal which forms a habitat in its own right as well as connecting to the river and stream systems that it crosses. In this way the Griffeen River to the east of 12th Lock is an important link between the Canal and the Liffey near Lucan. Spraints (droppings) were found in many places along the channel both in 2008 and 2010, including on the Canal bank where the river flows underneath. Otter signs were found to be plentiful between the 8th and 12th Locks (Wall 2008) though more on the northern than the southern sides (Reynolds, 2010). Though otters do occur in the millrace no evidence of them using this to cross the R120 could be found, This is probably because of obstructions on the western side of the bridge and on the Canal bank

The conservation status of the otter is poor overall (NPWS 2008) because of population decline since the 1980.

4.1.2 Badger.

Badgers are in the area to the west of 12th Lock but are not found in the Griffeen Valley (Wilson 2010). Their visits to 12th Lock must be seen as rare and the works will have no impact on them.

4.1.3 Bats

The only species of significance here is Daubenton's bat which roosts in stonework, especially bridges. Other species (e.g. common and soprano pipistrelle) hunt for food over the Canal but they roost in buildings to one side or the other and will not be affected by the bridge works. The cottage on the northern side does not have a suitable roof for these species and there was no clustering found there during the bat surveys (Kelleher 2007, 2009) which would have suggested roosting at that time.

4.1.4 Desmoulins whorl snail *Vertigo moulinsiana*

This tiny snail needs saturated, well-developed wetland vegetation that can develop marginally where seepages occur or in an abandoned canal. The nearest record to 12th lock was one made in the early 1970's near Clondalkin (where there is no more recent record). It is most unlikely to occur at 12th lock (Evelyn Moorkens, pers.comm.) because of bankside maintenance and other management. Even it were present there would be none in the section of the Canal affected by the road works.

The conservation status of this snail is bad and the threats listed in NPWS (2008) are site drainage and canal bank management.

4.1.5 Brook lamprey

All lamprey species require clean gravel in which to spawn and muddy, riverside sediments in which to mature into adults. There is thus no habitat in the Canal itself for them to occur. Brook lampreys have been found in some of the feeders (for example at Pollardstown Fen) and may sometimes occur in the Canal itself.

The conservation status of this lamprey is considered good (NPWS 2008)

4.1.6 Crayfish

The freshwater crayfish occurs in many places along the Canal and is often seen in the droppings of otters. The animals come to light, along with numerous fish, when sections of the Canal have had to be dried out for pipe crossings. Crayfish seek shelter in marginal roots or dig into the banks so are most unlikely to be present in the turbulence below 12th lock or in the cut stones of the lock walls. They do occur however in the millrace channel.

The conservation status of this species is regarded as poor because of a contraction in range.

4.1.7 Opposite-leaved pondweed *Groenlandia densa*

This waterweed is a native with a restricted distribution in Ireland and is protected under the Flora Protection Order 1999. It has been known for many years from Clondalkin to Leeson Street (Doogue et al 1998) though it fluctuates in abundance, partly in response to canal cleaning. It has been looked for repeatedly around 12th Lock (Goodwillie 2007 and the present July/August 2012 survey) but has not been found.

This species is probably in slight decline though it still has a wide distribution in central Ireland (Preston *et al* 2002).

4.1.8 Myxas glutinosa

The glutinous snail is an aquatic species that is rare all over Europe but has a strong population in the Grand Canal (Moorkens, pers.comm). It is found in clear, hard water conditions in both canals and some western lakes and is on the 'vulnerable' list, largely because of its decline in the rest of Europe. The snail would not be found in the turbulent conditions where the bridge is located.

4.2 Potential impacts on species and mitigation

4.2.1 Otter

In their movements along the Canal otters must occasionally cross the R120 as they could not find an aquatic route through the 12th Lock and bridge and the millrace is blocked west of the road. Easy access to the towpath on each side of the bridge should therefore be maintained during the construction period, preferably on both the northern and southern banks. Consideration should also be given to a permanent otter/badger pass on the southern side of the canal. This could take the form of a dedicated pipe open to the towpath. For crossings of 20m in length, a 60cm diameter pipe is recommended whereas for 20-50m, a 75cm pipe should be used (Scottish Natural Heritage)

The only other potential impact on the species from the proposed works is the reduction in local food supplies by culverting the millrace, thereby removing the crayfish it contains. The numbers of crayfish (and otters) involved do not make this a significant impact, however.

4.2.2 Badger

Badgers are such rare visitors to the site that there will be no impact on them from the proposed works. See above for badger pass.

4.2.3 Bats

Since there is a possibility that a few Daubenton's bats may use the old stone arch bridges during the season, a bat survey is recommended to be undertaken close to the construction date. This should cover the Canal and millrace bridges and the two cottages that are to be demolished. If appropriate a derogation licence will then be obtained from the NPWS to allow for the necessary development.

It would be beneficial to Daubenton's bat to install bat boxes under the new bridge. This would allow seasonal roosting by the animals.

4.2.4 Desmoulin's whorl snail

The animal does not occur in the area as far as is known and certainly not on the site of the works. If it was present downstream it could be sensitive like most aquatic animals to the changes of pH caused by concrete falling into the Canal and also to toxic chemicals from formwork release agents etc. To prevent this risk it is recommended that strict anti-pollution measures be specified for the construction works and that the contractors' method statements be approved beforehand. It is also recommended that the works will be closely monitored by the Employer's site staff.

4.2.5 Freshwater crayfish

This species does occur below the 12th Lock and in the millrace but the same comments apply to pollution risks as above for 4.2.4. The millrace is to be culverted for a distance of about 70m, bringing the water back to the Canal. It is recommended that crayfish living in it should be removed before the works and released into the Canal proper.

4.2.6 Glutinous snail

It is possible that this species occurs downstream but it will be protected from damage by the measures specified in 4.2.4.

5. IMPACTS ON NATURA 2000 SITES

The Canal flows east to join the Liffey estuary at the Grand Canal Basin while the River Griffeen flows into the Liffey at Lucan. The water from both the Canal and Griffeen would be in contact with the edge of the South Dublin Bay and River Tolka Estuary SPA (Site Code 4024) and South Dublin Bay cSAC (Site Code 0210). A little later the water meets the boundary of the North Dublin Bay cSAC (Site Code 0206) and the North Bull Island SPA (Site Code 4006). The Liffey channel (undesignated) remains distinct on the ebb tide but surface waters spread to all parts when there is tidal mixing. There is thus a possibility that Canal or River Griffeen waters could interact with bottom sediments to the detriment of the invertebrates living there and the wintering birds feeding on them.

However a number of factors make this extremely unlikely

1) No substances will be introduced to the Canal or River Griffeen waters that have sufficient toxicity to impact on the mud-dwelling organisms in Dublin Bay or that can be bio-accumulated by them.
2) Even if they are by accidents the dilution of Canal and River Griffeen waters when they mix with the flows in Dublin Bay is almost infinite and there is no likely synergy with other compounds in the waters of the Bay which could be detrimental.
3) Strict measures will be adopted to prevent material from embankments entering the Canal and River Griffeen during the construction phase.
4) Silt traps and oil interceptors will be installed on the new road drainage network which will discharge to the Griffeen River. There will be no discharge of road drainage to the Canal.

No effect could be felt by supra-tidal areas such as the North Bull Island.

The overall effects of the project are summarised below.

SCREENING MATRIX

1. Brief description of project	Bridge widening/road realignment
2. Brief description of the Natura 2000 sites	Estuarine sites in Dublin Bay with rich bird life, especially in winter; also supra-tidal sand banks
3. Individual elements of project (alone or in combination) likely to give rise to impacts on the Natura 2000 site by virtue of:	
size and scale	1.15km road construction, 8.2m wide extension to bridge
land-take	3ha for road
distance from the Natura site or key features of site	14.8km by Canal, 19.5km by Griffeen/Liffey
resource requirement (water abstraction etc)	Road stone, concrete, tarmacadam
emissions (where disposed of)	Concrete and chemicals isolated from water during construction. Sediment trapped before Griffeen R inflow during construction and use.
excavation requirement	None apart from pipework
duration of construction, operation, decommissioning etc	9 months construction
Other	n/a
4. Likely changes to site arising from	
reduction of habitat areas	None
disturbance to key species	None
habitat or species fragmentation	None
reduction in species density	None
changes in key factors of conservation value (e.g. water quality)	None
climate change	None
5. Likely impacts on the Natura site as a whole in terms of	
interference with the key relationships that define the structure of the site	None
interference with the key relationships that define the functioning of the site	None
6. Indicators of significance as a result of the above effects in terms of	
Loss	Not significant
Fragmentation	Not significant
Disruption	Not significant
Disturbance	Not significant
change to key elements of the site (water quality etc)	Not significant
7. Elements of the project, alone or in combination with others, where the impacts are likely to be significant or where the scale and magnitude of impacts is not known	None

6. CONCLUSION

The siting of the proposed bridge works (over an old lock basin) and the mitigation measures which will be in place (including any conditions imposed by the NPWS in their licence) will ensure that there is no significant impact to the Grand Canal pNHA or to the organisms contained within it.

Neither will there be an impact on the Natura 2000 sites in Dublin Bay where the Canal and River Griffeen ultimately discharge. This being the case there is no possibility of cumulative effects with other projects.

The mitigation measures will eliminate the risk to populations of rare or protected species that occur in the Canal and thereby to the Annexed species that occur in Natura 2000 sites.

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Appendix 5 – Stage 1 Screening Report for Appropriate Assessment

Carroll & Browne Consultants

Design and Management

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

ADAMSTOWN ROAD (R120) IMPROVEMENT SCHEME

HABITATS DIRECTIVE

STAGE 1 SCREENING REPORT FOR APPROPRIATE ASSESSMENT IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 6(3) OF THE EU HABITATS DIRECTIVE

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SOUTH DUBLIN COUNTY COUNCIL

ADAMSTOWN ROAD (R120) IMPROVEMENT SCHEME

HABITATS DIRECTIVE

STAGE 1 SCREENING REPORT FOR APPROPRIATE ASSESSMENT IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 6(3) OF THE EU HABITATS DIRECTIVE

03	8th August 2012	Final	Ger Browne	Sean McNulty	Ger Browne
02	3rd August 2012	Second Issue	Ger Browne	Sean McNulty	Ger Browne
01	25th July 2012	First Issue	Ger Browne	Sean McNulty	Ger Browne
Issue	**Date**	**Status**	**Written**	**Reviewed by**	**Authorised by**

CONTENTS

1. INTRODUCTION

General

Carroll & Browne Consultants has been commissioned by South Dublin County Council to prepare Part 8 Planning Documentation for the Adamstown Road Improvement Scheme.

Under Article 6(3) of the EU Habitats Directive, an "appropriate assessment" is required where any plan or project, either alone or 'in combination' with other plans or projects, could have an adverse effect on the integrity of a Natura 2000 site, i.e. a Special Area of Conservation (SAC) or a Special Protection Area for Birds (SPA), or on the conservation objectives of such a site.. This requirement is implemented in Ireland through Regulation 15 of the European Union (Natural Habitats) Regulations, SI 94/1997, as amended and Circular letters SEA 1/08 and NPWS 1/083.

A zone of influence of 15km is currently recommended in the case of plans or projects, and derives from UK guidance (Scott Wilson et al., 2006). Situated within 15km of the proposed scheme are several Natura 2000 sites designated under the EU Habitats Directive. Other Natura 2000 sites are located in Dublin Bay, which are outside the limit of the recommended 15km zone of influence. However, as both the River Griffeen and Grand Canal ultimately discharge into Dublin Bay, these Dublin Bay Natura 2000 sites are included in this Screening Report. The locations of the Natura 2000 sites are shown on Figure 1.

Article 6(3) of the EU Habitats Directive states:
Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6(4) of the EU Habitats Directive states:
'if, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of economic or social nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

This report comprises information in support of screening for Habitats Directive Assessment in line with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) of the Adamstown Road Improvement Scheme.

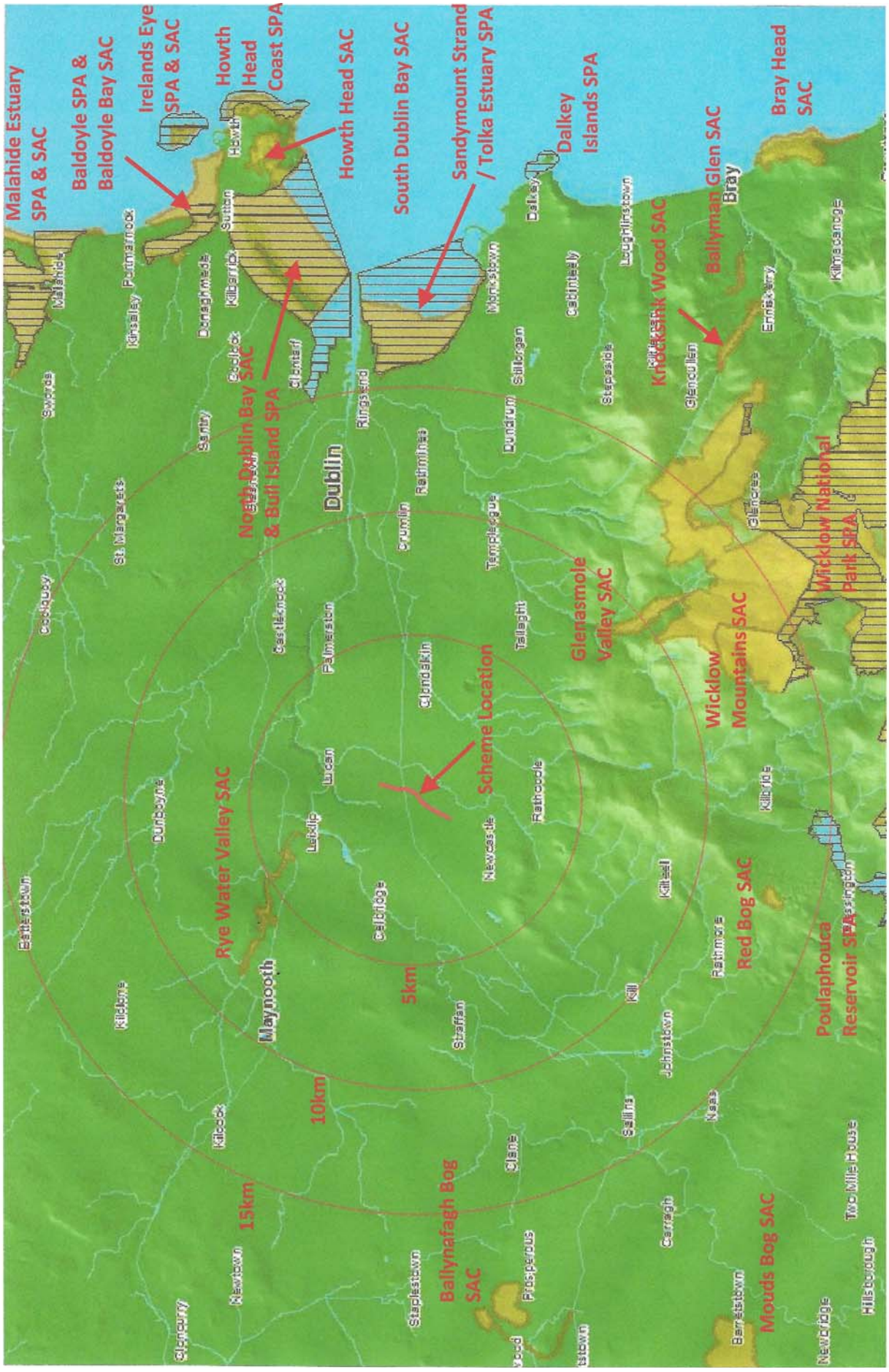

Figure 1 – SPA's & SAC's / Site Locations

The SDCC County Development Plan 2010 – 2016

The Adamstown Road Improvement Scheme is necessary for the purpose of upgrading an existing sub-standard road and for the provision of cycle and pedestrian facilities and public lighting.

The Scheme is a 6-Year Road Objective of the South Dublin County Development Plan 2010 – 2016. The proposed scheme therefore is required to address and adhere to the various policies of the County Development Plan.

The SDCC County Development Plan contains a number of policies and objectives that relate to the protection of the environment, landscape, water quality, and Natura 2000 sites. The protection of SACs and pNHAs is specifically referred to in Policy LHA 8 of the CDP:

> **Policy LHA 8**:
>
> *It is the policy of the Council to protect and preserve areas designated or proposed as Special Areas of Conservation (E.U. Habitats Directive) and proposed Natural Heritage Areas'.*

In addition, the requirements for appropriate assessment of potential impacts on Natura 2000 sites are detailed in Policy LHA 9:

> **Policy LHA 9:**
>
> *It is the policy of the Council that projects giving rise to significant direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this Plan (either individually or in combination with other plans or projects); Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be:*
>
> *(a) No alternative solution available;*
> *(b) Imperative reasons of overriding public interest for the plan to proceed and*
> *(c) Adequate compensatory measures in place.*
>
> *All subsequent plan-making and adoption of plans arising from this Plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. Where relevant, projects will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.*

A range of other policies in the County Development Plan 2010-2016 relate to water quality and waste water treatment, all of which aim to eliminate or reduce the potential for deterioration of water quality, both ground water and surface water. A list of relevant polices is included as Appendix 1.

Adherence to the above policies in the design and implementation of the proposed Scheme, in combination with the over-arching protective policies and objectives in the SDCC County Development Plan will therefore act to avoid significant downstream impacts on Natura 2000 sites.

2. STAGES OF THE APPROPRIATE ASSESSMENT

This screening assessment has been prepared in accordance with the European Commission Environment DG document, Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, referred to as the "EC Article 6 Guidance Document". The guidance within this document provides a non-mandatory methodology for carrying out assessments required under Article 6(3) and (4) of the Habitats Directive, and are viewed as an interpretation of the EU Commission document Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC, referred to as "MN2000".

There are four main stages in the process associated with the Habitats Directive, which are:

1) Stage One: Screening
   The process which identifies what the are likely impacts arising from a plan or project on a Natura 2000 site, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.

2) Stage Two: Appropriate Assessment
   Where the possibility of significant impacts has not been discounted by the screening process, a more detailed assessment is required. This is called an appropriate assessment and involves the consideration of the impact of the project or plan on the integrity of the Natura 2000 site, either alone or in combination with other projects or plans, having regard to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, it involves an assessment of the potential mitigation of those impacts.

3) Stage Three: Assessment of alternative solutions
   Should the conclusion of the appropriate assessment be that there are likely to be impacts which will affect the overall integrity of the Natura 2000 site, then it is required to examine alternative ways of achieving the objectives of the project or plan that avoids adverse such adverse impacts. Stage three of a Habitats Directive Assessment involves the assessment of alternative solutions.

4) Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain.
   Should it be found there are no viable alternative solutions to avoid adverse impacts on the Natura 2000 site, and should it be agreed that the project/plan can proceed despite such impacts (which can only be for overriding reasons of public interest), then compensatory measures must be put in place in advance of the implementation of the plan/project. The fourth stage of the Habitats Directive assessment process involves the assessment of the proposed compensatory measures.

This document presents the result of the Stage One Screening Process. In complying with the obligations under Article 6(3) and following the EC2000 and MN2000 Guidelines, this screening document has been structured as a stage by stage approach as follows:

- Description of the project;
- Identification of Natura 2000 sites potentially affected;
- Identification and description of individual and cumulative impacts likely to result;
- Assessment of the significance of the impacts identified on site integrity; and
- Exclusion of sites where it can be objectively concluded that there will be no significant effects.

3. DESCRIPTION OF THE PROJECT

The Project comprises civil engineering works associated with the improvement of the Adamstown Road. A general location of the proposed scheme is shown on Figure 2.

The proposed road improvement scheme and associated works extends from a point 0.5km north of the existing R120/ Nangor Road junction in the south to a point 0.3km north of the Grand Canal. It is approximately 1.2 km long and essentially follows the route of the existing R120 road. The average width of the proposed scheme to the south of the bridge is 13.6m and consists of two footpaths, cycle tracks and two lane carriageway. The average width to the north of the canal bridge is 11.5m and consists of two shared pedestrian/ cycle tracks with a two lane carriageway.

The existing 12th Lock Bridge, which is a protected structure, will be widened to the east to accommodate the proposed road improvement. The bridge originally built c.1770 has been significantly altered by previous works during the 1930s, which resulted in a doubling of its original width. The current width of the bridge is 8.13m and this will be extended to approximately 16.3m. The original stone arch (3.5m wide) on the western elevation will remain unaffected by the construction works.

The Road Improvement Scheme works include:

(a) Site Clearance.
(b) Demolition.
(c) Utilities protection in the vicinity of the various works locations.
(d) Road Construction consisting of kerbing and pavement works.
(e) Installation of new utility apparatus,
(f) Construction of footpaths and cycletracks,
(g) Installation of 2 no. signal controlled pedestrian crossings,
(h) Surface water drainage including attenuation measures, silt traps and oil interceptors,
(i) Widening of the existing 12th Lock Bridge,
(j) New Boundary Construction.
(k) Public Lighting
(l) Road Lining.
(m) Road Signage.
(n) Landscaping.

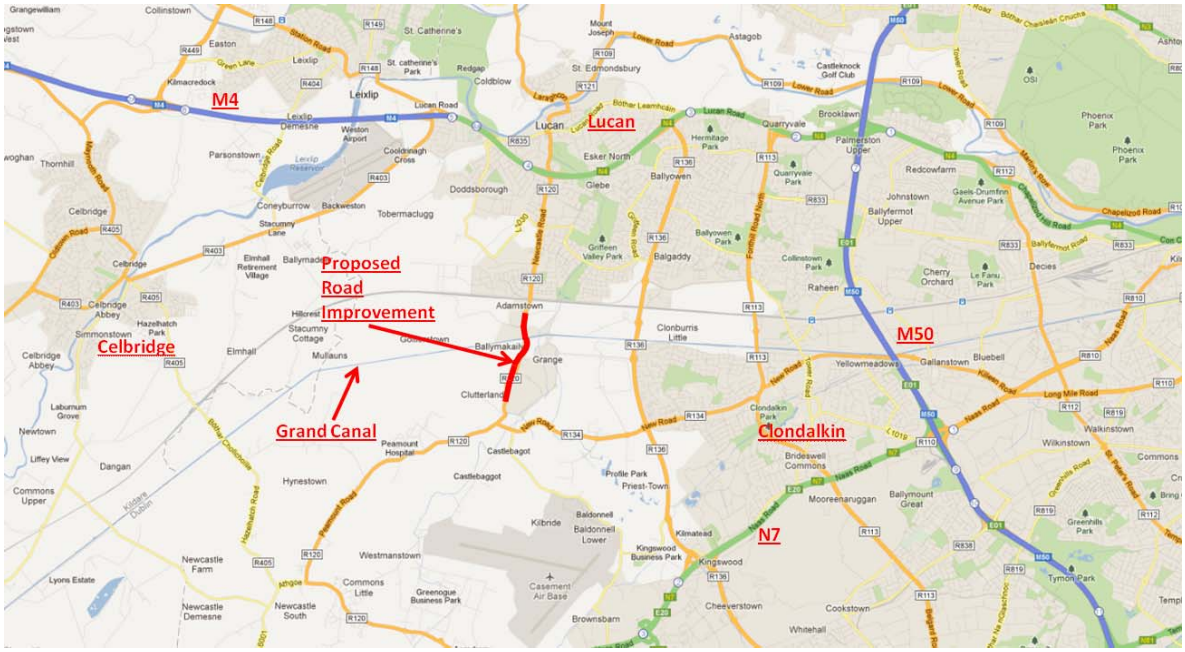

Figure 2 – Location of Proposed Road Improvement Scheme

4. IDENTIFICATION OF NATURA 2000 SITES POTENTIALLY AFFECTED

The proposed road improvement scheme is not directly connected with or necessary to the management of Natura 2000 sites in South Dublin County or elsewhere. As mentioned in Chapter 1 best practice recommends assessing Natura 2000 sites located within 15km of a proposed plan or project (see Figure 1).

Four SAC's and two SPA's are located within 15km of the proposed road improvement scheme. These sites are:

1. Rye Water Valley cSAC, Code IE0001398.
2. Red Bog cSAC, Code IE0000397.
3. Glenasmole Valley cSAC, Code IE0001209.
4. Wicklow Mountains cSAC, Code IE0002122.
5. Poulaphouca Reservoir SPA, Code IE0004063
6. Wicklow National Park (Wicklow Mountains) SPA, Code IE0004040.

The proposed road improvement scheme lies within the River Griffeen catchment. Surface water disposal from the road scheme will be discharged to the River Griffeen, which joins the River Liffey 3.2km further north at Lucan. The Adamstown Road crosses the Grand Canal at the 12th Lock. The Canal flows east to join the Liffey estuary at the Grand Canal Basin, along with the Dodder River. The water from both the Grand Canal and River Griffeen therefore enter the River Liffey and thereafter the Liffey channel into Dublin Bay. The water from the Griffeen and Grand Canal would be in contact with a number of SAC's and SPA's within the Dublin Bay region, which are:

7. South Dublin Bay cSAC, Code IE 0000210.
8. Sandymount Strand/Tolka Estuary SPA, Code IE0004024.
9. North Dublin Bay cSAC, Code IE0000206.
10. Bull Island SPA, Code IE0004006.

There is also one proposed Natural Heritage Area (pNHA) in the vicinity of the proposed road improvements, namely the Grand Canal proposed Natural Heritage Area (Site Code: 002104). The proposed road improvement works crosses this site at the 12th Lock.

For completeness all eleven sites are therefore included in this Screening Report. It is noted that there are other Natura 2000 site within the greater Dublin Bay area e.g. Howth Head Coast SPA (IE0004113) and Dalkey Islands SPA (IE0004172). It is considered that these sites do not require to be included in this screening process due to their distance from the proposed road scheme and to the dilution effect of the sea within the greater Dublin Bay area.

A summary of the main elements of interest for each of these sites is as follows:

1. Rye Valley Water cSAC

   This site is located between Leixlip and Maynooth in Co. Kildare. It extends along the Rye Water, a tributary of the River Liffey. The woodlands at Carton Demesne are the site of a rare fungus, Diderma deplanatum and also support birds such as Blackcap, Woodcock, and Long-eared Owls. On or about the lake, birds such as Little Grebe, Coot, Moorhen, Tufted Duck, Teal, and Kingfisher have been recorded. Kingfishers are listed in Annex 1 of the EU Birds Directive. The mineral spring occurring on the site is

also listed as an Annex 1 habitat of the EU Habitats Directive. The Rye Water is a spawning ground for Trout and Salmon while White-clawed crayfish Austropotomobius pallipeshas been recorded at Leixlip. Rare snail species and dragonflies also occur in the marsh vegetation near to Louisa Bridge. The main importance of the site lies in the presence of several rare and threatened plant and animal species and of a rare habitat – thermal, mineral, petrifying spring.

2. Red Bog cSAC

Red Bog, Co. Kildare, is located 3km north of the village of Blessington in east Co. Kildare. It comprises a wetland complex of Lake, fen and bog, situated in a hollow between ridges of glacially-deposited material and it is underlain by rocks of Ordovician age. The site is of particular conservation significance as it supports transition mire, a habitat listed in Annex 1 of the Habitats Directive.

Draft Conservation Objectives:

a) To maintain the Annex 1 habitats for which the cSAC has been selected at favourable conservation status – Transition mires and quaking bogs.
b) To maintain the extent, species richness and biodiversity of the entire site.
c) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

3. Glenasmole Valley cSAC

Glenasmole Valley SAC contains a high diversity of habitats and plant communities and lists three habitats listed on Annex I of the EU Habitats Directive: petrifying springs with tufa formation, semi-natural dry grassland and scrubland facies on calcareous substrate (Festuco-Brometalia) (important orchid sites), and Molinia meadows on calcareous, peaty, or clayey-silt-laden soils (Molinion caeruleae). Both petrifying springs and orchid-rich calcareous grasslands also qualify as Priority Habitats under the Habitats Directive. The presence of four Red Data Book plant species further enhances the value of the site as does the presence of populations of several mammal and bird species of conservation interest. The River Dodder flows through the valley and has been impounded here to form two reservoirs which supply water to south Dublin.

Draft Conservation Objectives:

a) To maintain the Annex 1 habitats for which the cSAC has been selected at favourable conservation status – *Petrifying springs with tufa formation, Semi-natural dry grassland and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites), Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
b) To maintain the extent, species richness and biodiversity of the entire site.
c) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

4. Wicklow Mountains cSAC

Wicklow Mountains SAC is an important complex, extensive, upland site covering much of the Wicklow Mountains and a portion of the Dublin Mountain range. Within the boundaries of South Dublin County, the SAC encompasses the mountains of Ballymorefinn, Corrig, Kilakee, and Cruagh, stretching south to the summit of Kippure Mountain at the border with County Wicklow. While the entire SAC lists ten habitats listed in Annex I of the EU Habitats Directive, the vegetation within the South Dublin County portion of the site mainly provides good examples of the typical upland habitats of heath, blanket bog and upland grassland. Several rare, protected plant and animal species also occur in this SAC.

Draft Conservation Objectives:

To maintain the Annex 1 habitats for which the cSAC has been selected at favourable conservation status:– Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea; Natural dystrophic lakes and ponds; Northern Atlantic wet heaths with Erica tetralix; European dry heaths; Alpine and Boreal heaths; Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe); Blanket bog; Siliceous scree of the montane to snow levels; (Androsacetalia alpinae and Galeopsietalia ladani); Calcareous rocky slopes with chasmophytic vegetation; Siliceous rocky slopes with chasmophytic vegetation; Old sessile oak woods with Ilex and Blechnum in British Isles.

a) To maintain the Annex 2 species for which the cSAC has been selected at favourable conservation status: - Lutra lutra
b) To maintain the extent, species richness and biodiversity of the entire site.
c) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

5. Poulaphouca Reservoir SPA,

Poulaphouca Reservoir SPA (Site Code 4063) is located in the western foothills of the Wicklow Mountains. The principal interest of the site is the Greylag Goose population, which is of international importance. The site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the site. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull.

Main Conservation Objective:

To maintain the special conservation interests for the SPA at favourable conservation status – Greylag Goose, Lesser Black-backed Gull, Wetland and Waterbirds.

6. Wicklow National Park (Wicklow Mountains) SPA

Wicklow Mountains SPA is an extensive upland site, comprising a substantial part of the Wicklow Mountains. The site, which is within the Wicklow Mountains National Park, is fragmented into about twenty separate parcels of land. Much of the site is State-owned and managed for nature conservation based on traditional landuses for the uplands. The site is of high ornithological importance as it supports very good examples of upland and woodland bird communities, several of which are very rare at a national level. Two species, Ring Ouzel and Red Grouse, are Red-listed and their status is of high conservation concern.

Main Conservation Objective:

a) To maintain the special conservation interests for the SPA at favourable conservation status – Merlin, Peregrine.

7. South Dublin Bay cSAC

South Dublin Bay SAC lies south of the River Liffey and extends from the South Wall to the west pier at Dun Laoghaire. It is a fine example of a coastal system with extensive sand and mudflats. South Dublin Bay is also an internationally important bird site.

Draft Conservation Objectives:

a) To maintain the Annex 1 habitats for which the cSAC has been selected at favourable conservation status: - Mudflats and sandflats not covered by seawater at low tide.
b) To maintain the extent, species richness and biodiversity of the entire site.
c) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

8. Sandymount Strand/Tolka Estruary SPA

South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex. It is of international importance for Light-bellied Brent Goose and of national importance for nine other waterfowl species. As an autumn tern roost, it is also of international importance. Furthermore, the site supports a nationally important colony of Common Tern. All of the tern species using the site are listed on Annex I of the E.U. Birds Directive, as are Bartailed Godwit and Mediterranean Gull.

Main Conservation Objective:

To maintain the special conservation interests for the SPA at favourable conservation status – Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Golden Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern, Arctic Tern, and Wetland and Waterbirds.

9. North Dublin Bay cSAC

North Dublin Bay SAC (Site Code 000206) covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site. This SAC site is an excellent example of a coastal site with all the main habitats represented. It holds good examples of ten habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several wintering bird species have populations of international importance, while some invertebrates on the site are of national importance. The site also contains a numbers of rare and scarce plants including some which are legally protected.

Draft Conservation Objectives:

a) To maintain the Annex 1 habitats for which the cSAC has been selected at favourable conservation status:– Mudflats and sandflats not covered by seawater at low tide; Annual vegetation of drift lines; Salicornia and other annuals colonising mud and sand; Atlantic salt meadows (Glauco Puccinellietalia maritimae); Petalophyllun ralfsii; Mediterranean salt meadows (Juncetalia maritimi); Embryonic shifting dunes; Shifting dunes along the shoreline with Ammophila arenaria (white dunes); Fixed coastal dunes with herbaceous vegetation (grey dunes); Humid dune slacks
b) To maintain the extent, species richness and biodiversity of the entire site.
c) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

10. Bull Island SPA

North Bull Island SPA site is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Lightbellied Brent Goose, Blacktailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl.

Main conservation objective:

To maintain the special conservation interests for this SPA at favourable conservation status: Light-bellied Brent Goose, Shelduck, Pintail, Shoveler, Oystercatcher, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Redshank, Turnstone, 20,000 wintering waterbirds, Teal, Ringed Plover, Golden Plover, Sanderling, Curlew, Black-headed Gull, Wetland & Waterbirds.

11. Grand Canal pNHA.

The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal proposed Natural Heritage Area (pNHA) comprises the canal channel and the banks on either side of it. The canal system is made up of a number of branches - the Main Line from Dublin to the Shannon, the Barrow Line from Lowtown to Athy, the Edenderry Branch, the Naas and Corbally Branch and the Milltown Feeder. Water is fed into the summit level of the canal at Lowtown from Pollardstown Fen, itself an NHA.

A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The hedgerow, although diverse, is dominated by Hawthorn (Crataegus monogyna). On the limestone soils of the midlands Spindle (Euonymus europaeus) and Guelder-rose (Viburnum opulus) are present. The vegetation of the towpath is usually dominated by grass species. Where the canal was built through a bog, soil (usually calcareous) was brought in to make the banks. The contrast between the calcicolous species of the towpath and the calcifuge species of the bog is very striking.

The diversity of the water channel is particularly high in the eastern section of the Main Line - between the Summit level at Lowtown and Inchicore. Arrowhead (Sagittaria sagittifolia) and Watercress (Nasturtium officinale) are more common in this stretch than on the rest of the system. All sites for Hemlock Water-dropwort (Oenanthe crocata) on the Grand Canal system are within this stretch. The aquatic flora of the Corbally Extension of the Naas Branch of the canal is also very diverse, with a similar range of species to the eastern Main Line.

Otter spraints are found along the towpath, particularly where the canal passes over a river or stream. The Common Newt breeds in the ponds on the bank at Gollierstown in Co. Dublin. The Rare and legally protected Opposite-leaved Pondweed (Groenlandia densa) (Flora Protection Order 1987) is present at a number of sites in the eastern section of the Main Line, between Lowtown and Ringsend Basin in Dublin.

The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods (NPWS, 1995).

5. IDENTIFICATION AND DESCRIPTION OF INDIVIDUAL AND CUMULATIVE IMPACTS LIKELY TO RESULT

Individual Impacts

A potential hydrological link is identified as being the primary source-pathway-receptor between the site of the proposed road improvement scheme and the ten Natura 2000 sites. In addition to a direct ecological link, a potential hydrological link is identified with the proposed Natural Heritage Area (pNHA) site.

Sites 1 to 6 inclusive have no direct ecological or hydrological link to the site of the proposed road improvement scheme. Negative impacts on these sites are therefore highly unlikely by virtue of distance of the scheme from each site and the absence of source-pathway-receptors. In summary the primary source-pathway is surface water runoff from the proposed road scheme, which cannot impact with any of these sites.

Sites 7 to 10 inclusive have no direct ecological link to the site of the proposed road improvement scheme. These sites however do have a hydrological link to the site of the proposed road improvement scheme via the River Griffeen and Grand Canal systems as they potentially provide a vehicle for the transfer of negative impacts to these sites downstream, which rely on water quality for the maintenance of their conservation objectives. During the construction of the proposed road improvement scheme and during its operational phase it is possible that sediment or pollutants could be carried to Dublin Bay via the River Griffeen or Grand Canal. However a number of factors make this extremely unlikely, namely:

a) An environmental management system will be implemented during the construction stage, which will require strict procedures to be implemented and which will ensure that no construction material (cementitious material, concrete additives, petrochemicals etc) from the road site can be introduced to the Canal or River Griffeen waters.
b) No substances from the road scheme have sufficient toxicity to impact on the mud-dwelling organisms in Dublin Bay or that can be bio-accumulated by them.
c) Even in the very unlikely event of an accident occurring, the dilution of Canal and River Griffeen waters when they mix with the flows in Dublin Bay is almost infinite and there is no likely synergy with other compounds in the waters of the Bay which could be detrimental.
d) Silt traps and oil interceptors will be installed on the new road drainage network, which will discharge to the Griffeen River. There will be no discharge of road drainage to the Canal system.
e) A Maintenance Procedures Manual for the completed road drainage system, including procedures for routine maintenance of gulleys, surface water pipes, silt traps and oil interceptors, will be prepared and issued to South Dublin County Council for adoption and incorporation into their annual road maintenance programme.

In summary negative impacts on these sites are therefore highly unlikely by virtue of distance of the scheme from each site and the factors mentioned above.

Site 11 is not a Natura 2000 site but is a proposed Natural Heritage Area (pNHA) site, which has been included in this Screening Report for completeness. In this regard an Ecology Report has been prepared to examine potential ecological impacts of the proposed Adamstown Road Improvement

Scheme including bridge works at the 12th Lock, with regard to any rare species of flora and fauna, to the proposed Natural Heritage Area (Grand Canal). This Ecology Report is included in the Environmental Report. Its conclusions find that the proposed road scheme, including proposed bridge works (over an old lock basin), in conjunction with the mitigation measures which will be in place, will ensure that there is no impact to the Grand Canal pNHA or to the organisms contained within it.

Cumulative Impacts

This screening assessment for the proposed Adamstown Road Improvement Scheme indicates there will be no significant impacts arising from the proposed scheme. In relation to potential cumulative impacts from the proposed road scheme with other plans and projects, it is a requirement that each of these will be subject to screening for appropriate assessment to ensure there will be no significant negative impact on Natura 2000 sites. Taken together, adherence to this required approach will ensure that no cumulative impacts will arise from the proposed road improvement scheme.

6. ASSESSMENT OF THE SIGNIFICANCE OF THE IMPACTS IDENTIFIED ON SITE INTEGRITY

No impacts on Natura 2000 sites have been identified in relation to the proposed Adamstown Road Improvement Scheme.

7. EXCLUSION OF SITES WHERE IT CAN BE OBJECTIVELY CONCLUDED THAT THERE WILL BE NO SIGNIFICANT EFFECTS.

No impacts on Natura 2000 sites have been identified in relation to the proposed Adamstown Road Improvement Scheme and therefore all identified sites can be excluded from further stages of the Appropriate Assessment process

8. CONCLUSION

This screening report has evaluated the proposed Adamstown Road Improvement to determine whether or not significant negative impacts on Natura 2000 sites are likely to arise by virtue of the schemes implementation. The report finds that the proposed scheme, either individually or in combination with other plans and projects, shall not give rise to significant effects on the integrity of any Natura 2000 site.

The Appropriate Assessment procedure for this proposed road improvement scheme is therefore concluded at this Screening Stage and a detailed (Stage 2) Appropriate Assessment is not required.

SIGNED: _____ **DATED: 10th August 2012**

Ger Browne, Chartered Engineer

Director

APPENDIX 1 – LIST OF COUNTY DEVELOPMENT PLAN OBJECTIVES AND POLICIES THAT ARE RELEVANT TO WATER PROTECTION IN SOUTH DUBLIN COUNTY.

Policy LHA 21 River and Stream Management
It is the policy of the Council to implement a strategy (prepared on a regional basis) for the management of rivers and streams throughout the County.

Policy LHA 22 Watercourses
It is the policy of the Council to protect, maintain, improve and enhance the natural and organic character of the watercourses in the County and to promote access, walkways and other recreational uses of their associated public open space, subject to a defined strategy of nature conservation and flood protection.

2.3.4 Strategy: The strategy of the Council for the development of Water Supply and Drainage in the County is as follows:
• Continue the sustainable development and improvement of the water supply and foul drainage systems throughout the County to meet the anticipated water and drainage requirements of the area.
• Protect surface water catchments and manage catchment areas where appropriate to protect the surface water drainage infrastructure of the County.
• Implement the provisions of national policy and legislation in the control of water pollution.
• Ensure that existing and proposed developments are not subject to undue risk of flooding.
• Conserve treated water by active leakage detection, non-domestic metering and development of infrastructure.
• Actively pursue and resolve water leakage.

Policy WD 1 Water Supply and Drainage
It is the policy of the Council to co-operate with adjoining authorities to continue the sustainable development and improvement of the water supply and drainage systems throughout the County to meet the anticipated water and drainage requirements of the area, in accordance with the recommendations set out in the 'Greater Dublin Strategic Water Supply Study' and the 'Greater Dublin Strategic Drainage Study', and the proposed 'Dublin Region Water Services Strategic Plan' when adopted.

Policy WD 3 Quality of Surface Water and Groundwater
It is the policy of the Council that the ongoing development of the County shall be undertaken in such a way as not to compromise the quality of surface water (and associated habitats and species) and groundwater.

Policy WD 4 Soil and Groundwater Contamination
It is the policy of the Council to require adequate and appropriate investigations to be carried out into the nature and extent of any soil and groundwater contamination and the risks associated with site development work, where brownfield development is proposed.

Policy WD 5 Water Quality Management Plans
It is the policy of the Council to promote the implementation of water quality management plans for ground and surface waters in the county as part of the implementation of the EU Water Framework Directive, and in accordance with the policies and objectives and programme of measures of the Eastern River Basin Management Plan and any further amendments.

Policy WD 6 Sustainable Urban Drainage Systems (SuDS)
It is the policy of the Council to ensure that all development proposals incorporate Sustainable Urban Drainage Systems (SuDS).

Policy WD 8 Water Pollution Abatement Measures
It is the policy of the Council to implement the provisions of water pollution abatement measures in accordance with National and EU Directives and legislative requirements in conjunction with other agencies as appropriate.